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Collection Number Book
#10

No. 20614 - 21392

Aug. 5 - Dec. 5, 1943

Colombia

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COLOMBIA

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Collection and Field Note Book

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8900	2765		
9000	2805		
9100	2835		
9200	2870		
9300	2900		
9400	2930		
9500	2960		

Aug. 5 - ~~small~~ small ravine,
south of Rio Corales, Pasca,
Cundinamarca

20614 *Desmodium*
bushy ravine in pasture.
in brush in ravine

15 *Lamprocarpa*
in brush in ravine

16 *Piper*
in brush in ravine

17 *Ambrosia*
edge of pasture

18

19 *Galium hypocarpium*
edge of brush

20 *Castilleja*
edge of pasture

21

edge of pasture
22 *Castilleja*
in brush

23 *Befaria*

tall herb, 3 m. tall, growing
up through bushes,
stems clinging to clothes
when touched, fls. ^{magenta} purple
straggling bushy tree
about 6 m. tall, fls. white.
shrub 3 m. tall.

perennial forming low
thicket-like clumps,
shrub about 3 m. tall,
branches somewhat drooping,
fls. white.

vine-like, elongate, climbing
through brush, fruits orange,
fleshy.

erect, glistering white-hairy,
distal parts of bracts red,
calyx green.

spreading herb, probably
annual, fls. yellow.

weak shrub 1.5 m. tall,
tips of upper bracts red, distal
half of calyx red, corolla
green above, with lower
edge orange yellow.

shrub 3 m. tall, leaves
glaucous beneath, fls.
rose color, not sticky

- 20624 *Polygala*
edge of pasture
- 25 *Vaccinium*
~~edge of pasture~~
- 26 *Menispermaceae*
- 27 *Veronica*
- 28 *Ranunculus*
edge of pasture
- 29 *Tournefortia*
- 30
edge of brush
- 31 *Alchemilla*
slope in pasture
- 32 *Trifolium*
pasture
- 33 *Veronica*
in edge of Rubus thicket in pasture
- 34 *Blechnum*
in Rubus thicket in pasture, rocky place
- 35 *Daucus*
in thicket in pasture
- 36 *Quercus*
along river
- 37 *Quercus*
along river
- 38 *Salix*
bottom of ravine

- fls. purple, roots with
wintergreen odor.
- small bushy tree, corolla
oval with green lobes and
crips, fruit immature
vine, extensively twining
through bushes and trees.
- shrub, fruits green
plants spreading from
root crown, fls. yellow,
fruits green.
- shrub 2.5 m. tall, fls.
white.
- elongate, fls. white.
- fls. greenish white.
- fls. yellow.

leaves rather stiff.

tree 10 m. tall, 3 dm. thick.

tree 15 m. tall, 10 dm. thick,
trunk gnarled.
rounded-topped tree, 10 m. tall,
branches with weeping habit.

Aug. 5 - trail just above Pasca,
Rio Corrales, Cundinamarca
old stone wall along trail, limestone region.

20639

Muehlenbeckia

clambering through thicket, common

40

Peperomia

crevices in stone wall, common.

41

Polypodium

crevices in stone wall, common

42

Asplenium

crevices in stone wall, common

Aug. 7 - trail from Pasca to
La Constancia, Cund., up the
Rio Corrales to the fork of the Rio
Juan Viejo, up the left bank
of this to where it comes down
through a great water-gap;
conspicuous for miles down
the valley. Just above the
water-gap, at an altitude of
about 3200 m. is La Constancia,
which is nothing much more
than a large house.

Up the valley ~~to~~ from Pasca
the broad valley is cleared
completely except for strings
of vegetation along watercourses
and the upper portions of
the side ridges, which are
still forested.

The willows in this region all
have a weeping habit. They are scattered
in the ravines ~~at~~ ^{around the} town.

- vine climbing in bushes
and small trees.

- sterile branches erect with
abundant very fleshy leaves,
fertile branches ascending.

- with sparse, thin leaves.

- rhizomes extensively creeping.

- leaves thick, coriaceous.

- leaves thin - coriaceous.

Just below the water gap the
trail enters forest. The
gap is well wooded
with a bushy type of
forest which seems to
contain a great variety
of species. The walls
of the gap are tremendous
vertical cliffs, almost
bare of vegetation.

Above La Constancia what
is visible is mostly pasture.
Eucalyptus globulus is
planted here, as is also
Cupressus prob. benthamii.
This latter is said to be
native in the region, but
all I have seen looks
as though it may have been planted.
It varies considerably in habit.

- 20047 *Lepidium*
in heavily grazed pasture
- 44 *Veronica*
in heavily grazed pasture
- 45 *Acacia*
edge of cliff, low brush
- 46 *Hypericum brachyphyllum*
edge of cliff in low brush
- 47 *Hypericum*
edge of cliff in low brush

Aug. 7 - top of ridge between Rio
Juan Viejo and Quebrada Atadero,
near head of this ridge, about
14 km. s.e. of Pasca, Cundinamarca
paramo ridge, wet ground

- 48
- 49 *Hedyotis*
growing in tussocks of *Hedyotis*

- 50 *Hedyotis*

Aug. 7, - Hills above Laguna Larga,
headwaters (probably) of Rio Negro,
25 km. e. of San Bernardo, Cund.
Open paramo, springy
and seeping with water.

51

abundant

- from ~~the~~ gnarled woody
- rootstock
- reclining, fls. pale blue
- shrub
forming low rounded
- mounds.
- shrub 0.5 m. tall, flowers
- yellow. "chite"
- low shrub, flowers yellow.

forming compact tussocks
mat. like, spreading by
creeping over ground; flowers
- white to purplish.

depressed shrub, growing
taller in sheltered places,
observed from 10000 ft. alt.
on up.

An extensive paramo, with
at least 2 species of
Copeltia very abundant, a
rounded, privet-like ^{woody} shrub
quite abundant.

forming dense, stiff tufts,
inflorescences not abundant, purple.

20452 *Alchemilla*

common among hummocks, with 20452

53

common among hummocks, with 20453

54 *Paepalanthus*common, ~~forming small cushions~~ in wet spots.

55

not common.

56 *Bartschia*

common

57 *Eryngium humile*

not common, in very wet spots

58

very rare, only two plants seen, in mud.

59 *Hedyotis*

common, covering hummocks

60 *Elaphoglossum*

not common, on top of hummock.

Aug. 3 - near Laguna Negra, just below Laguna Larga, headwaters of (probably) Rio ~~Grande~~, 25 km. e. of San Bernardo, Cund.

A small finca, raising chiefly potatoes in a more or less sheltered place among great rocky hills.

61 *Blechnum*

rocky ledge.

62 *Peperomia*rocky ledge, sheltered by *Blechnum*

spreading, stiff, green.

spreading, soft, gray.

fls. white.

forming small cushions.
erect

erect, purple, fls. and bracts purple.

involucre stiff, greenish-black outside, white within, fls. whitish.
fls. bright blue. ^{head} level with ground, cup shaped with

edges flaring
~~forming~~ forming a thick mat,
rooting at nodes, leaves
in 4 ranks, fls. white
to purplish.
fronds erect, infolded so as
to be cymbiform.

This is agriculture reduced to its lowest and most difficult terms. Potatoes, a few onions, and a cow.

The vegetation is pure paramo. *Espeletia*, *Castilleja*, *Hypericum*, a few other small shrubs + many tufted herbs.

Rhizome short, erect, not evident above ground, fertile fronds erect, sterile ascending. leaves fleshy.

Lupinus

growing near garden but said to be native

64 Helianthus

growing on thatched roof of house

Aug. 8 - quebrada Honda, one of the headwaters of quebrada Cabana, 10 km. north of Nevado de Sumapaz, Cund. small flat along stream in páramo, wet ground.

65 Geranium

scattered in matlike vegetation

66

forming a thick mat

67 Valeriana

scattered clumps

68 Halenia

pair sized colony near stream

69 Halenia

scattered plants with #20667

70

71 Senecio

72

common

73

Hypericum

common

74

scattered small colonies

erect suffrutescent herb 1 m. tall, infl. erect, flowers magenta-purple with central part of banner yellow. large rounded clump. intricately branched, petals white, split.

fls. white

fls. white

from a thick woody root. fls. white, infl. ~~reddish~~ ^{reddish} plant and fls. pale green. plants in small clumps. petals white, plants caespitose.

erect clumps, involucre maroon, rays bright purple, disk reddish brown, heads nodding.

erect shrub, 1 m. tall, involucre yellow, fls. whitish.

erect, forming small clumps, fls. yellow.

low spreading clumps, fls. yellow.

erect, ~~to~~ caespitose, heads nodding.

20675

Hypoleucum

abundant throughout region

20676

scattered near stream

Aug. 3 - ^{near} Crest of Alto San Juan, in a small pass about 10 km. n. of Nevado de Sumapaz, west of Quebrada Rabona open mountain slope, with 4000 m. abundant *Espelletia*.

20677 *Espelletia*

abundant, growing with #20677 with no apparent intergradation.

infl. axillary spreading

20678 *Chusquea*

abundant over whole region

20679 *Espelletia*

abundant over whole region, here partially giving place to #20677, not intergrading.

Aug. 3 - west of Cuchillo Andabobo lie Laguna Andabobo, a group of small marshy lakes. The vegetation here merits a much closer

erect shrub 2 m. tall, twigs

-erect, fls. yellow

erect shrub 1 m. tall; gray.

rosette on top of stem about 6 cm. thick, covered with old leaf bases, making the whole about 15 cm. thick, about 1.5 m. tall, heads nodding, rays yellow. erect, about 0.8 m. tall here, in more sheltered places much larger, forming small brakes several m. tall, some but not all plants in flower. rosette on top of stem about 6 cm. thick, covered with old leaf bases, appearing about 15 cm. thick. stem of this plant about 1 m. tall, others up to 2 or 2.5 m., infls. spreading, golden-yellow, heads nodding, fls. yellow.

study than is possible riding by on a mule. Seems to be a good development of aquatic and marsh plants.

near headwaters of Rio San Juan

- ✓ Aug. 9 - ~~Valley of Y. Sabana~~, high
on ~~eastern slope~~ of Alto San Juan
9 km north of Nevado de Sumapaz,
A small cirque-like valley ^{4000 m.}
with a tiny woods of a tree
Serecis up to 6 m. tall. The páramo
has been burned over relatively recently.

- 20630 *Urtica*
under Serecis trees, abundant
but mostly sterile
- 31
abundant under trees
- 32
on ~~the~~ mossy banks, common
- 33 *Vaccinium*
on mossy banks and ledges, common
- 34 *Ribes*
common on ravine sides
- 35 *Gentiana*
very rare, ^{few} plants found on eroded
~~the~~ ridges.
- 36 *Cardamine*
wet ravine bottom
- 37 *Epilobium*
wet ravine side, in clump of
other plants
- 38 *Erigeron*
exposed ledges
- 39 *Baccharis*
exposed ledges and eroded ridges.
with # 20640

woods surrounded by
open páramo. Small rivulets
descending through the
woods, ground covered
with low plants, mostly
mat-formers or rosettes, and
mosses.

weakly ascending,
strongly stinging

loose tufts, infl.
- drooping.
mat-forming, brittle
fls. greenish-white.

erect ~~or~~ ascending
shrub, up to 1 m. tall, fls.
dull purplish red, fruit
- reddish-green, not quite ripe.
fls. dull purple.

weak, prostrate to ascending,
- fls. white.
fls. deep magenta,
plant reddish.

fls. white with purplish
tinge, plant caespitose, gray.
prostrate, buds purple,
fls. whitish. ♂

- 20690 *Baccharis*
exposed eroded ridges + ledges, with #20689.
- 20691 *Baccharis*
exposed ridge, with #20692
- 3 92 *Baccharis*
exposed ridge, with #20691
- 93
exposed ridge
- 94 *Epilobium*
steep slope at foot of cliff, in
clump of other plants.
- 95 *Bromus*
in woods on slope at foot of cliff.
- 96 *Hydrocotyle*
wooded base of cliff
- 97 *Stellaria*
ledge on cliff
- 98
cliff and slope at foot of cliff, abundant
- 99
ledges on cliff, common
- 20700 *Senecio*
dominant and only tree in woods.
- 01
on cliff, ~~not~~ common, forming
clumps, mostly out of reach
- 02 *Polystichum*
common on slope at base of cliff.
- 03
occasional in woods

- prostrate, buds green, fls. white
- ♀
shrub 1 m. tall, erect, ♀
fls. white
- shrub 1 m. tall, erect, fls.
white. ♂.
- mat-like, fls. pinkish,
fruit red, likely immature.
plant scarcely reddish,
calyx dark red, corolla white.
- creeping
- forming a loose mat,
flowers white.
- reclining herb 1 m. long or
less, ~~prostrate~~, ascending at
tips, gray, involucre maroon,
rays bright purple; disk red-
brown.
- decumbent at base, a coarse
herb, fls. yellowish brown
- ~~gray~~ gnarled tree up to 6 m. tall,
fls. yellow, only occasional
branches in flower.
- herbage glaucous, fls.
bright lemon yellow.
- Rhizomes branched, forming
hummocks, fronds strictly erect.
erect shrub 2 m. tall,
fruit black.

20704

Castillejo

abundant on slope at base of cliff

05 *Lupinus*

abundant on slope at base of cliff

06

growing in very dense vegetation on cliff.

07 *Cynoglossum*

common in region, especially in wetter places.

08 *Acaena*

common on exposed ledges and slopes

09 *Jamezonia*

occasional on ledges and other exposed places

10 *Lysyrrhynchium*

rare on ledges

11 *Bartlettia*

common in exposed places

12 *Carex*

common, especially in depressions

13

common ^{mossy} on exposed ledges and banks14 *Oenothera*

common on mossy banks and violet margins.

15

occasional on exposed mossy banks.
(possibly deformed form of #20706.)16 *Alchemilla*

very abundant in exposed places

spreading stems suffrutescent at base, branches erect, calyx red distally, corolla green with lower edge orange.

herb forming large decumbent masses.

fls. violet.

fls. lavender.

caespitose, lower leaves decaying into a gelatinous mass, fls. from pale blue to white.

rosettes flat to ground,

scapes ascending.

rhizome deeply buried, fronds strictly erect.

erect, fls. yellow.

bracts and flowers purple.

deep based, loose spreading tufts, culms ascending.

rosettes tight to ground,

loosely caespitose, heads yellow.

prostrate, fls. yellow.

closed in morning.

fls. lavender.

~~is~~ very prostrate.

22

1943 - Colombia

20717

Nertera granadensis

mossy banks

18

Laguna

mossy banks

19

mossy banks

20

*Lecythis*common in ~~open~~ open places

21

Rumex tolimensis Wedd.

common in wet places

det.
RCF.

22

common in rivulets and oozy place
with # 20724, no intergrades.

23

Cardamine

in rivulet

24

~~Cardamine~~common in rivulets and oozy place
with # 20722, no intergrades.flat turfey mossy place about
4 m. across at head of valley, appearing
to be a filled in pool, very wet,
with rivulet on one side.

25

banks above pool

26

27

28

Paramo de Sumapaz

23

very prostrate, fls. greenish.

prostrate, fls. white.

fls. white

~~the~~ involucre purple,

fls. yellowish.

- giant plant up to 2 m. tall,
the leaves dead at base
of fruiting & flowering plants,
other sprouts with leaves
and huge coriaceous terminal
bud with great quantities
of mucilage, ocreous transparent
and filmlike.fls. white or pale pink,
closed in morning, open
about noon.

fls. white

fls. purple, closed in
morning, open about noon.

forming a dense prickly turf.

- spikes erect, sticking out of moss.
fls. white.

20729

1 30

Geranium

1 31

Ranunculus

in wettest part

3 32

dominant plant in part of pool

2 33

1 34

rare,

35

rare

1 36

Isotria medeoloides A. Braun det. H.P. Fuchs 1960
only one plant found

37

Cardamine

in a slightly raised, grassy
part of turf

Aug. 10 - same loc.

a similar boggy spot, but
somewhat older, more hummocky.
(a few plants from here included
with yesterday's when they seemed
obviously the same.)

38

Epilobium

in deep moss-turf

4 39

in shallow water forming a
dense growth.

1 40

Luzula

on hummocks

1 41

Geranium

common in deep moss turf

heads whitish, button-like.

fls. white.

fls. yellow.

forming dense ~~area~~ turf.

fls. white.

erect

tops of quills well below
surface of turf making
a small depression.
prostrate; fls. white.

fls. white.

fls. pink

20742

in deep moss turf

wet ravine bed covered
with deep moss and
grassy hummocks

43

on hummock

44

Castilleja

in deep moss and grass

45

on hummock

46

on deep wet moss

47

Bromus

on hummock

48

Carex

on hummocks, common

49

on hummocks

50

on hummock

cliff and slope at base,
with wet ravine at bottom.

51

*Luzula*abundant on cliff on tiny
ledges and in crevices.

L 52

wet ~~at~~ bottom of ravine, not

53

Agrostis

wet bottom of ravine, not shaded.

fls. blue

stiff large clump.

erect bracts ~~at~~ scarlet
distally, calyx green, corolla
green but apparently not
exserted.

infl. dark purple.

prostrate, fls. white.

infl. drooping, purple

deep rooted, small ~~clumps~~
plants with few culms.
infl. stiffly erect.

infl. drooping

tufts

odor strongly like calumy
- fls. white.
forming round, hard, but
more or less hollow hummocks.

20754

in crevices in Azorella(?) hummock

55

mixed in Azorella(?) hummock

56

slope at foot of cliff, one of the dominant plants on steep slopes and wet places.

57 Escallonia

edge of dense woods on slope at foot of cliff

exposed slopes and ledges with seeps and rivulets very abundant.

58 Ranunculus

mossy ledge

59

rare, wetish slope

60

common, exposed slope

61 Geranium

growing out of a dense mass of overhanging vegetation

62 Polypodium

crevice under overhanging ledge on face of large boulder

63 Alchemilla

high, exposed slope

64

under edge of great boulder wet slope

65

Potentilla

wet slope

deeply trough-shaped.

forming large stiff clumps.

stiff spiny rounded shrub 2 m. tall, fls. white, calyx and ovary dark red.

fls. yellow.

erect with slightly decumbent base, rays pale yellow, disk greenish yellow.

erect with a long decumbent base, herb, involucre maroon, rays bright purple, disk yellow. fls. pink.

fronds hanging down, rhizome glaucous.

low, somewhat protected by bushes.

prostrate, spreading, fls. yellow.

- 20766 *Habenaria*
in deep ~~moss~~ wet moss turf
on wet slope.
- 67 *Alchemilla*
exposed slope
- 68
exposed bare slope, ~~to~~ tightly
matted cushion vegetation
- 69 *Galium*
in large clump of grass on
exposed slope.
- 70
exposed slope
- 71 *Asplenium*
crevice in boulder in ravine
- 72
exposed slope, rare
- 73 *Asplenium*
under edge of boulder in ravine
- 74 *Draba*
abundant in moss-turf on
wet slope
- 75
common on exposed slope in
cushion vegetation
- 76
sides of ravine and open slope
- 77
in moss turf on very wet slope
- 78a *Geranium*
~~cushion~~ dominant in patches
of cushion vegetation on exposed slope

fls. ^{pale}
green

stiff rounded clump.

stems prostrate, heads
on ~~erect~~ ascending peduncles,
rays bright yellow striped
on back with brown, disk
brownish

fruits green.

involucres maroon, fls.

pinkish.
erect.

roots fleshy

erect

fls. white

plant glaucous-green, fls. blue

prostrate, peduncles erect.

forming soft hummocks,

fls. white.

fls. pink.

20778

Lupinus

4

ledge near top of cliff

Aug. 11 - same loc.

79 Carex

common on lower slopes

80

common in wet places but
only one seen in bloom

81 Carex

scattered in various habitats,
not rare

82 Lupinus

wet slope, large colony,
mostly sterile

83 Gnaphalium

moassy bank

84 Geranium

moassy bank

85 Geranium

moassy bank

86 Senecio

moassy, boggy head of small stream

Aug. 11. top of ~~ridge~~ ^{alt. San Juan} above last loc.

rocky wind-swept backbone of mountain

87 Hedysotum

open spaces between bushes and
tufts of grass, also rock crevices

4200 m.

decumbent woody base
about 7 dm. long, covered
with dead leaves, ^{many} branched
at point of upturn, fruiting
spike columnar, 3 dm. tall.
(seed sample).spreading clumps, mature
inflorescence drooping
erect, rays pale yellow.

erect

erect, fls. blue-violet
banner with pink center
(same as #20778)forming small cushions, fls. ^{pale} pink.
(diff. from #20785)forming small cushions
(different from #20784)shrubs 1.5 m. tall, fls. pale
yellowprostrate with erect branchlets,
leaves on these conspicuously
4-ranked, fls. white to pale purple.
Mat thinner, more attached to
ground in exposed places, looser
and deeper when protected

- 20788 *Paepalanthus*
exposed ridge top
- 89 *Elaphoglossum*
partly protected rock crevice
- 90 *Lycopodium*
protected by clumps of grass
- 91 *Senecio*
exposed rocks
- 92
among grass clumps, only one seen

Paráms de Sumapaz
Under this general name
is included an enormous
expanse of high country,
from 3000 to 4500 or more meters
in altitude, centering around
the Nevado de Sumapaz, between
the south end of Cundinamarca
and Meta. It extends along
the Cordillera Oriental for 60 km.
from Osera almost to El Hato, with
branch ridges extending in
all directions. Much of the
high country is rolling,
with high sharp ridges
here and there, and many
small lakes in the depressions.
Many of the streams that
radiate out originate in
these lakes. The páramo
separates the drainages of

forming dense cushions, fls. white
erect, fronds revolute

stems mostly underground,
leafy branches close to ground,
spikes erect.
erect but somewhat gnarled,
fls. pale yellow
erect

the Rio Magdalena and the
Rio Orinoco, and the headwaters
of the streams are so
entwined that it is often
difficult to tell which way
the water is eventually
going. Seeps and rivulets
are everywhere.

present 3 →

This páramo is burned
over every year, so that the
grass will produce new
tender shoots which are
more palatable for livestock.
Therefore it is difficult to
tell what its original
condition was. The destructive
effects of Colombian so-called agri-
culture thus extend even to such
forbidding areas as the páramo.
A few tiny potato farms are
scattered here and there, even

up as high as 3100 m. I have seen practically no stock up here to benefit by such burning. Growth is naturally very slow, so overgrazing is easy. However, I have seen few evidences of it in this páramo.

This description should be regarded as fitting only this particular páramo in its present burned condition. The burning doubtless is the reason why the ~~the~~ cushion plants are mostly small.

The páramo is basically a grassland of principally three kinds of stiff bunch-grass. There all form dense hummock-like bunches, with stiff, harsh, sharp quill-like blades and occasional inflorescences. The bunches are spaced an average 4 or 5 dm. apart.

Another grass, possibly a *Chusquea*, although not climbing, is locally abundant. It too is very stiff, but it forms colonies rather than bunches and its blades are flat and lanceolate. In exposed situations it is low, but erect, 6 or 8 dm. tall

The soil is thick, up to 3 dm., and very black. It is often so saturated with water as to be a soft mud.

when not in fruit. The spikes are several dm. taller. In wetter places it becomes 1 m. or more tall, and in sheltered places it forms small cane-brakes up to 3 or 4 m. deep.

The most characteristic plant of the páramo is *Espelletia* or "~~Fraxelja~~" "*fraxelja*". This curious composite genus strangely resembles the silver-sword of Hawaii, but has axillary inflorescences. It is a rosette plant, the large woolly rosettes usually topping a post-like stem, composed of a pith, a woody cylinder, a softer outer cylinder, all about 6-10 cm. thick, surrounded by a coating of persistent leaf and inflorescence bases as thick again. The leaves are ~~lanceolate~~ oblanceolate spatulate or oblong, very densely woolly, and 2-3 dm. long. The inflorescences form a ring, projecting outward or upward somewhat longer than to several times as long as the leaves, and are even more densely woolly. The flower heads are yellow, enveloped

in the white or golden wool of the inflorescence, and are usually nodding. In the Paramo de Lurnapay are at least 4 perfectly distinct species of *Espeletia*, which can be told apart from a considerable distance.

These plants are thickly scattered over practically the whole paramo, from one to several meters apart. They grow to a height of 3 m. at the most, but of course are usually from stemless to one meter. They give a characteristically unearthly aspect to the paramo landscape.

A shrubby *Hypericum* from 0.5 to 2 m. tall is very common in most parts of this paramo. It has bright yellow flowers, much larger than those of the other half dozen species of this genus that abound here.

Shrubby *Compositae* - *Baccharis*, *Senecio*, etc. are locally common. A tree species of *Senecio* with leaves like a *Buddleia*, forms small patches of woods in sheltered valleys. The trees reach a height of 6 m.

Between the bunches of grass the ground is covered

by mosses and various moss-like cushion plants. A mat-forming *Hedyotis* is the most common. At a glance it resembles the *Pyxidanthus* of the New Jersey pine barrens. It begins at about 3500 m. and is still common at 4200 m. Several geraniums, a *Vaccinium*, an *Oenothera*, and one or two *Ericaceae* are very prominent. More rare are several *Compositae*, *Senecio*?, several species of *Hypochaeris*, *Euphorbia* etc. A number of species of *Alchemilla* (?) and several *Umbelliferae* are also common. One of the *Alchemilla*, a prostrate one, forms much of the ground cover at high altitudes. A ~~low~~ cushion-forming *Hypericum* is also common. Low hummocks of a tiny *Paspalanthus* (*Eriocaulaceae*) are seen everywhere.

Scattered here and there are several sedges, *Carex* (2 sp.), *Rhynchospora*, etc. and a yellow *Lythrum* which grows in the grass bunches. From the sub-paramo up to about 3700 m. a stiff, upright species of *Hedyotis*, probably *H. nitida* is very common. It is not seen at the higher altitudes. *Lupinus* of several species is locally

most
yellow flowered
Lythrum
are common

Pin-like in appearance
with blue flowers in small
scattered over the region.
Castilleja is common
and conspicuous.

common. Most of these are quite ordinary-looking, though one has large magenta flowers. One, however, is magnificent. It has a thick stem, often decumbent and quite woody at base, large dark green leaves, the bases with long white hair, and a columnar inflorescence up to 3 dm. tall, resembling, from a distance, one of the Canary Island Echinus. The rachis is about 3 cm. thick, hollow, and bears flowers spirally as close as they can be set on this column. The whole is 6 or 8 cm. thick. The flowers are violet, with a pink wedge on the banner. Linear bracts project beyond the flowers. The fruiting inflorescence, with crowded silvery-silky pods about 2 cm. long, is as spectacular as the flowering one, or more so.

In wet spots, seeps, springy places, ravine bottoms, etc., a different flora is found. Usually still present are the bunch grasses. Sedges are more abundant. Moss forms a deep soft wet turf. In this are many

Rumex acetosella
forms red patches
here and there
over the whole
paramo.

Columbic
Purys, the striking
great paramo
columnar spikes
common locally.

curious tiny plants of diverse families - Umbelliferae, Bragiacae, Ranunculaceae, Compositae, and, apparently rarest of all, an Isoetes. This, along with most of the others is found in ~~the~~ small open areas which are evidently filled in pools, tiny bogs but lacking sphagnum. Only one plant of the Isoetes was found by me, completely immersed in the turf, appearing as a depression lined with stiff, thick, sharp quills.

A Stellaria (?) with leaves like Salvinia, forms soft hummocks here and there. A striking Castilleja with four-sided spikes and scarlet, imbricate bracts ~~is~~ presents occasional oriental looking finger-like columns. An umbellifer with an odor exactly like celery, but a low rosette plant is common on wet slopes, as is also one of the most curious things of all, an umbellifer (Agrostis sp.?) which forms hard, round hummocks of tiny rosettes, but which is almost hollow inside - filled only with

a white flower
Drosera and
a green flower
Halenia are
common in
springy
places.

loose decayed leaves and radiating stems. Also forming hummocks, but very prickly ones is a tiny pinnaceous plant resembling *Oreobolus*.

Plant 4 →

Shrubby *Senecios* and other compositae, as well as a number of striking looking herbaceous compositae, one genus with brilliant purple or in one species yellow, ~~ligulate~~ heads, another perhaps the most densely woolly of all plants and with great, nodding heads without rays, are also common in these wet places.

Rock ledges and cliffs have several interesting things - *Luzula*, a great *Draba* 6 dm. tall, a bright yellow *Erysimum* (?), a stiff, spiny *Escallonia*, a woolly *Senecio* with round revolute leaves, and several ferns. A couple of *Aspleniums*, one possibly a form of *A. trichomanes*, a *Woodia* or *Cystopteris*, two *Elaphoglossums*, stiffly erect, a stiff, erect, acaulous *Blechnum*, and the curious *Jamersonia* with its erect delicate, unnatural looking fronds.

lower paramo and

The ^{lower} sub-paramo slopes, below the paramo proper, a sort of transition to the forest below, present a curious superficial resemblance to the heath balds of the southern Appalachians. An abundance of Ericaceous shrubs - *Gaultherias*, *Perrettias*, *Vaccinium*, *Thibaudias*, and others not recognized, add to this aspect. However, a great variety of Melastomaceae of all sizes and colors, most of them strikingly beautiful, and the usual shrubby compositae, ~~shrubby~~ *Hippocrepis*, and *Thuchlaebenckia*, would be amazing indeed, in a heath bald. *Hedyotis* might be found in both, or at least near a heath bald, but the delicate *H. procumbens* ~~is~~ bears little vegetative resemblance to the shrubby *H. nitida*.

This vegetation, greatly extended by destruction of the forests, is one of the most colorful in the tropics. There is always a riot of flowers in bloom.

The paramo region as a whole is a gigantic flower garden, or rather, rock garden. It is to be hoped that some of it may be spared for the future botanists and plant lovers to see.

Insert

Eryngium acaule, a queer little rosette plant, is quite common here as in other páramos. Its heads of bluish-white flowers with white bracts are quite distinctive. More rare is a large prickly species of the same genus which at first sight would surely be mistaken for a bromeliad.

The term "páramo" means little to the average reader. To the average Colombian it simply means a cold, inhospitable wind- and rain-^{and sleet-}swept high region. Botanists have attempted to use the term with various limitations. In line with ~~my~~ ^{the} idea of using popular terms in ecology to represent as nearly as possible what they mean to the people to whom they are a part of the language, I would suggest using the terms "páramo" and "sub-páramo" to designate that part of the northern Andes which lies above the limit of forest proper and below the line of perpetual snow. This would correspond, roughly, with what the Colombian

means by the term "páramo". However, no two Colombians seem to have exactly the same idea of it.

The division into "páramo" and "subparamo" zones, to correspond, roughly, with the ~~lower~~ upper, predominantly herbaceous vegetation belt and the lower, predominantly shrubby belt seems justifiable on purely vegetational grounds. Of course, there is no fixed boundary between these, just as there is no clear boundary between sub-páramo and forest. Clearing, overgrazing, fire, and other destructive agents have apparently greatly extended downward the subparamo from its original 10000 to 11500 ft. ~~lower~~ limit. This is probably due to the fact that páramo and subparamo are early, though usually arrested, stages in a succession in such a wet climate as prevails in high Colombia.

In any event, whether the terms have any true geobotan-
(old. p. 52)

Aug. 12 - Rio San Juan, at Cerro Los Amarillos, where the river comes out of the Alto San Juan, Cundinamarca páramo slope near river.

20793

Miconia

sheltered places where it is not

94

Eryngium

seen occasionally in the páramo but common here

Aug. 12 - Rio San Juan, just above San Juan.

Cundinamarca

páramo slope & just above river

95

Espeletia

96

Spiranthes

between grass clumps

97

Fuchsia

in clump of bushes in a tiny sheltered depression

Aug. 12 - Rio San Juan, near crossing just above San Juan.

Cundinamarca

sub-páramo bush in valley bottom

98

Vaccinium

99

Hedyotis nitida

very common

20800

Pernettya

erect, cypress-like habit,

berries purple.

single or caespitose, heads purplish white.

acaulous rosettes, cymes ascending, rays yellow, disk brown.

erect, flowers white.

~~the~~ erect weak shrub, growing up through other bushes, fls. rose-pink, pendent, fruit spherical, dark red, fleshy.

bush 1 m. tall, berries purple, erect shrub 1 m. tall, fls. white within, purple without, erect shrub 1 m. tall, fls. white, leaves reticulate beneath.

Aug. 13 - Quebrada Las Chócheras (R. Bejuco),
just about 3 km. above its confluence
with Rio Sumapaz, 70 km. s. s. e.
of San Bernardo, Cundinamarca
sub-paramo bush on
side of valley.

70901

Calceolaria minobefaria sp. minobefaria

Aug. 13 ^{top of} ridge between Quebrada
Las Chócheras (R. Bejuco) and Quebrada
Tunal (Rio Gobernador), 20 km.
s. s. e. of San Bernardo, Cund.
Open paramo, no bush,
somewhat grazed.

02

wet ground between grass clumps

03

Espeletia
common over large area

04

Juncus
large scattered colony in wet
places

det. Molau

weak shrub 1-3 m. tall, fls. yellow.
leaves rather glutinous.

fls. blue, heads closing
immediately after gathering.
stem about 3 dm. tall,
others up to 1 m. or, in protected
places, even 1.5 m. tall, bearing
of leaves, mostly ascending,
of varying widths on different
plants, those on this plant
rather narrow, veins
conspicuous beneath,
inflorescences almost
erect, wool golden or
brown, involucre, fls. yellow.

Aug. 13 - Quebrada El Tunal (Rio Gobernador) 2 km. above its confluence with Rio Sumapaz, 27 km. s.e. of Pandi, Cundinamarca
 20805 *Gaiodendron*
 sub-paramo bush or low forest.

Aug. 14 - ridge s. of Quebrada El Tunal (Rio Gobernador), 28 km. s.e. of Pandi, Cundinamarca
 sub-paramo on cut-over forest land
 06 *Castilleja*

07 *Galium hypocarpium*
 in clumps of vegetation

08 *Lobelia tinctoria*
 in clumps of vegetation

09 *Jamesonia*
 lower side of boulder on slope

Aug. 16 - Rio Arroyo

cut over forest, now of a paramo character, in places planted to potatoes, in places grazed,

10

on *Solanum tuberosum*

11

grazed slope

The forest here certainly once extended up to 11500 ft. and possibly to 12000. Largely destroyed now, replaced by sub-paramo bush and paramo. Shrub 3 m. tall, others seen taller, flowers white, petals recurved.

upper bracts and calyxes scarlet, corolla green above, red beneath. climbing in bushes, fruit orange, fleshy.
 fls. lavender with yellowish center.
 large clumps, few seeds erect.

forming the "polvo" disease, said to cut the potato crop in half. older plants rounded, bushy, fls. white, strong oily odor. "apio"

ical, plant-sociological, or phytogeographical significance or not interests me little. They are convenient designations for two types of vegetation with an aspect and floristic composition not duplicated elsewhere in the world or indicated by any other term, and of extraordinary beauty and interest. Of course, corresponding zones of dwarf vegetation exist at high altitudes on various tropical mountains. Geobotanists likely have or will invent a general term to include all of them. Páramo should likely be restricted to regions from Costa Rica southward to Ecuador (or possibly Peru). It is said that the northernmost páramo is that on Irazú (?) in Costa Rica.

Insert 2

In some areas an aculeate *Blechnum* with erect leathery leaves is one of the common plants, while in one or two sub-páramo localities a rather similar *Blechnum* with a tall trunk and spreading sterile fronds was seen. A shrubby *Senecio* with terete green leaves and yellow flowers is also abundant in some areas.

Insert 3

It must not be imagined that the boundary of the páramo is always at 3000 m. This is the lower limit of possibly natural subpáramo vegetation. In places forest extends up to as much as 3700 m. One slope of a mountain will be densely wooded, while another will be extreme páramo, apparently dependent on the exposure. Patches of páramo exist in depressions completely surrounded by forest. I suspect that temperature is the deciding factor, since páramo vegetation exists in ~~many~~ sheltered places where wind could have little influence.

Insect 4

Perhaps most remarkable of all is a giant Rumex, up to 2 m. tall, spreading by underground rhizomes. As the erect stems form giant inflorescences with leaf-like bracts, the leaves below die and the inflorescence ripens and dies. Meanwhile other shoots are emerging, the leaves very large, with giant, transparent veins, the huge ~~terminal~~ conical terminal bud covered by them and secreting great quantities of mucilage.

Aragoa, one of the most curious paramo plants is not common in this region, but at least one species is found locally.

20812

common in brush appearing in pasture

13

Gentiana

rare in pasture

14

Rhynchospora

common

15

Hypericum

common in brush appearing in pasture

16

Vaccinium

common in pasture and
brush above pasture

17

Carex

along rivulet

18

Hypericum

common in less grazed parts of pasture

19

Graptophyllum

weed in pasture, very common

20

common everywhere in region

21

rare in wetland place

22

Graptophyllum

common weed in pasture and potato patch

23

in bushy place on ridge

24

Polypodium

on tree trunk in pasture

25

common in ravines

26

Senecio

common over whole region

low shrub, corolla urn-shaped,
white with ~~pink~~ red tips to lobes,
fruit black, fleshy.
erect, fls. purple.

small tufts, culms
ascending or erect.

erect, fls. yellow,
leaves 4-ranked.

low shrub, fls. pink,
berries purple.

small clumps, culms
ascending, spikes pendent,
fls. yellow.

small tufts, infl. erect.

icy odor when broken "Apio".

erect.

low spiny shrub, 0.7 m. tall,
fruits immature, said to be
black and edible when mature.
slightly glaucous, esp.

rhizomes.

shrub 2 m. tall, calyx and
hypanthium red, corolla pale yellow,
erect, brittle shrub up to 1 m. tall,
heads yellow. Called "guasquin" and used
for liver ailments but this taken by local
people from a book, really applies to another sp.

leaves
taste, fleshy,
green;

- 20927 *Liopyrinchium*
common
- 28 *Geranium*
very common
- 29 *Lupinus*
common
- 30
weed in potato patch
- 31 *Lathyrus*
in bushes and tufts of vegetation
in pasture
- 32 *Equisetum*
common weed in potato-patch
- 33 *Halenia*
scattered in pasture
- 34 *Vicia*
in bushes and tufts of vegetation
in pasture.
- 35 *Fuchsia*
in bushy places
- 36 *Rubus*
common in bushy places
- 37
weed in potato patch
- 38 *Rumex acetosella* not
common in patches everywhere
- 39 *Geranium*
common in pasture
- 40 *Alchemilla*
common in pasture
- 41
thickets

- tufts, flowers yellow.
- spreading tufts, fls. pink.
- "yerba del dolor".
stems prostrate, spreading
from root, racemes erect,
fls. violet with pink wedge
- in banner.
prostrate
- fls. purple.
"albergilla"
- "cola de caballo"
- fls. greenish-white.
- said to cause death of newly
castrated ~~calves~~ ^{steers} if eaten.
- fls. rose-pink, pendent.
- low, spreading canes, glaucous.
fls. rose-pink.
- prostrate, fls. pink.
- infl. red. "~~yerba del dolor~~"
- "pasta Colorado"
- spreading, prostrate with
ascending infl., fls. pink.
- "yerbo del dedo"
- valued for pasture, spreading
by runners and holding soil "la plegadera"
- shrub 3 m. tall, fls. white. "salvia grande"

20842

Baccharis

common in pasture

43

Monina

rare in thickets

44

Salvia

pasture

45

Tropaeolum

steep slope above river

46

Hedyotis nitida

very common everywhere

47

pasture

48

Castilleja

pasture

Aug. 18 - same loc.

exposed, grazed paramo ridge

49

grassy slope

50

common, but not much in flower

51

52

Gaultheria

very common

53

in small tree in sheltered place.

shrub 1 m. tall.

shrub 2 m. tall, fls. blue.

- "cinto"

fls. deep crimson, infl. and calyx maroon. "salvia" vine, fls. vermillion with greenish tip to spur.

- ~~"cobito"~~ "cobito del indio"

shrub up to 1 m. tall, fls. white with lobes tipped outside with purple.

- buds purple.

prostrate, calyx purplish.

- fls. pale bluish.

suffrutescent herb, calyces and upper bracts scarlet distally, corolla green, with lower edge yellow distally.

rosettes clustered, hair on scape dark red, fls. butter-yellow small bushy shrub 0.5 m. tall, rays purple.

- bracts and flowers dull coral; roots thick, fleshy. low dense bush 0.5 m. tall, but in sheltered places

forming a gnarled tree-like shrub up to 3 m. tall, trunk 3 dm. thick.

- fruits slightly fleshy, purplish-green fls. fleshy, greenish yellow, lips slightly marked with brown

Aug. 19 - Rio Arroyo

A giant species of *Chusquea* is common here, but sterile. The canes resemble sugar cane, and are as much as 4 cm. thick, usually about 2.5 cm. They are used to form the horizontal part of the wattle of the mud and wattle houses, as well as part of fences, etc.

shrub-like
fringed

Aug. 19 - Cordillera ^{de las Cruces} south of Rio Arroyo.

Byzantine
Adapted

20854

Hydrocotyle

in wet soil in trail

55

Xyris

on bare paramo ridge

56

Chusquea

common everywhere in paramo slopes

57

Polypodium

high rocky ridge

58

Hedyotis

high rocky paramo ridge

only seen in this vicinity, but very abundant here.

59

Hedyotis

(same as above)

Crops cultivated here are potatoes (most important), wheat (a little), onions, *Vicia faba*, called "aba", and a kind of cabbage.

Trifolium repens and a round-leaved species of *Alchemilla* are favorite pasture plants. *Cupressus* sp. planted as ornamental.

Barley, radishes, carrots, amaranth said to be cultivated but not seen.

very prostrate

tufts

varying greatly in size

fronds erect

rounded dense bushes 1-2 m. tall, lower side of leaf yellow, rest of leaf bright green.

rounded bright green bush 1-2 m. tall, buds pinkish, fls. white, under side of leaves yellow

main north affluent of Rio Grande
Aug. 20 - Quebrada Humateita south
of Cordillera de las Cruces.

Mato

- 70360 wet forest in deep ravine
Begonia
epiphytic and on ground, common
- 61 Polypodium
epiphytic
- 62
epiphytic
- 63 Esfollitia
subparamo brush, occasional
- 64 Chusquea
abundant in flat ravine bottom,
subparamo brush.
- 65
~~common~~ occasional in forest
- 66 Blechnum
common locally in sub. paramo
brush and ~~at~~ edge of forest.
- 67 Chusquea
common in region.
- 68 Fuchsia stipularis
rare, near stream

stems fleshy, fls. pink.

fronds bent downward.

vine, ~~climbing~~ climbing in
lower branches of trees;
somewhat fleshy; corolla
flesh-orange, pitcher-like,
pendent.

stem 15 m tall, ^{yellow, dist.} rays, dull yellow

3 m. tall, or more, forming
small thicket, mostly
flowering.

vine climbing in trees.

fl. dull orange.

on a trunk 1.5 m. tall, 20 cm.
thick, but largely of leaf
bases and nodes.

(photo
but of
different
plant)

forming dense tangles,
this thicket the only one seen
in flower.

erect, single stem, fls.
red.

Aug. 20 - ~~Guatorda Humadilla~~
main stream south of Cordillera
de las Cruces.

dense river-bank forest
20869 Psychotria

70 Guatorda

Aug. 21 same loc.

71 Gunnera
steep wet low cliffs above river

72 Fuchsia
steep banks & overhanging
river-bed.

73
fallen tree in river-bed.

74
fallen tree in river-bed

75 Nertera granadensis
steep wet banks of river

76 Cleome
steep bank of river

77
dense river-bank forest, in
deep shade

78
dense river-bank forest

79
dense river-bank forest

the slopes above this stream
are in places wooded with
almost pure stands of *Alnus* sp.
(*alisó*), noticeable because of white
trunks and very sparse foliage.
- sparsely branched shrub 1 m.
tall, fls. and fruits white.
- spreading tree, fruits
immature.

low erect stem 1.5 m. tall,
leaves ^{peltate} concave above, spikes
erect, much mucilage
around base of
stem. Some leaves twice
(photo) as large as one collected.
vine-like shrub, hanging
over other vegetation.

many clumps, all flowering,
fls. white, waxy.
rare

prostrate, fruits red.

shrub 1.5 m. tall, fls.
orange.
- ripe fruit red, fleshy.

shrub 2 m. tall,
vine-like, fls. white.

20380

Liabum

abundant on overhanging river-bank

81

*banicula*dense river-bank forest,
shady flat.

82

Psychotria

shady flat, dense river-bank forest

83

Vaccinium

overhanging river-banks, on low cliff.

84

Pilea

on fallen tree in dense river-bank forest.

Aug. 22 - Rio ~~Huandara~~ ^{del Nevado} east
end of Cordillera de las Guineas
not far above confluence with Rio ~~Huandara~~
~~rain forest on steep slope~~

85

Cinchona sp.edge of small opening caused
by landslide.

86

Vittaria

base of tree trunk

87

Cinchona officinalis L.

88

galea

89

Cinchona officinalis L.

90

Cinchona officinalis L.

91

Cinchona pubescens Vahl.

suffrutescent
pendent herb, caps
milky, fls. yellow.

fruit white, inflorescence
blackish.
pendent bracts red,
waxy, fl. white.
creeping tangled mass.

Meta

Anal. Bellis.	
g + c	4.6
(g + c)	3.4
ci	0.7
g + c	5.3
TCA	3.2

Tree 3 dm. thick, 15 m. tall
(specimen from sprout), stipules
and midribs reddish.
(bark sample).
somewhat flattened.

Anal. Bellis.	
g + c	4.6
(g + c)	3.4
ci	0.7
g + c	5.3
TCA	3.2

sapling 3 m. tall, green
single stem 1 m. tall.
sapling 2 m. tall, green.
tree 3 dm. thick, 15 m. tall,
(specimen from sprout) green.
(bark sample)
tree, divided at base, two trunks
each 4 dm. thick, 20 m. tall
(specimens from large sprout)
stipules recurved
(bark sample)

20892 *Cinchona officinalis*2a 12
ca. 2.5Anal. Pelles
94C 2.9
(9504) 2.2
Li 0.4
94C 2.9
T. 0.393 *Palicourea*94 *Psychotria*

Aug. 23 - same loc.

95 *Lycopodium*

abundant on an old landslide

96 Orchid

abundant on an old landslide

Aug. 24 - same loc.

97 *Symbolanthus*top of long ridge in bushy quarried
edge - top forest

98

steep slope above river canyon
small ledge99 *Viola*~~steep bluff~~ cliff left above
landslide, open soft rock.20900 *Lycopodium*Aug. 27 - Rio ^{de} ~~Humades~~ ^{Nevado}, east end
of Cordillera Las Cruces, south of
Rio Arroyo, across from prominent
peak in Cordillera Los Laureles.20900a *Burmeistera*

Meta

20900 *Lycopodium*

cliff left above landslide.

01

steep slope, densely wooded,
occasional ~~in~~ in this drainage
in similar situationstree 10 m. tall, 1 dm. thick,
green, fls. purple (bark sample)
(bark sample)

shrub 1.5 m. tall, fruit yellow.

shrub, m. tall, fls. white,

fruit blue.

spikes pendent.

fls. pinkish-white.

shrub 2.5 m. tall, flower
greenish yellow.vine-like, without stinging
hairs, forming a tangle,
flowers white.creeping, fls. light
violet

erect

shrub 2 m. tall, fls. orange-red
pale distally.

Aug. 27 - East end of paramo on
Cordillera de Las Cruces, south
of Rio Arroyo. Meta

bushy sub. paramo slope

20902 Arragona

03 Hedysotis

common

Aug. 28 - Quebrada el Carriño,
~~pedregal~~ main affluent of Rio Arroyo
on south side, Meta

paramo slope
04 Geranium
common

05

common in burnt over
wet ~~marshy~~ place

Aug. 28 - Quebrada de los Tumbos,
affluent of Rio Arroyo, ~~pedregal~~ affluent
of Rio Arroyo on south side, Meta

Meta

06

patch of woods on steep slope
surrounded by paramo

07 Calceolaria

~~marshy~~ marshy place in bottom
of valley

shrub 2 m. tall, fls. white, odorless.
~~shrub~~ bright green shrub
2 m. tall, leaves with yellow
stripes beneath, buds
pinkish, fls. white.

caespitose but small tufts,
branches weakly ascending.
fls. rose pink, paler distally.
in other places much
larger.

spikes erect, fls. bronze-
yellow, striped with brown.
fls. yellow.

Aug. 28 - Quebrada Pedregal,
~~this~~ ~~the~~ main affluent of Rio Arroyo
 on south side,

Meta

- 20908 *Mimulus*
 wet place trampled by cows

Aug. 29 - Rio Arroyo well above
 confluence of Quebrada Pedregal,

Meta

banks of stream, edge of cultivated
 patch

- 09 *Mimulus*
 muddy yellow, also dark
 blue spots

- 10 *Epilobium*
 muddy edge of cultivated ground.

- 11 *Epilobium*
 muddy edge of cultivated ground

- 12 *Scrophularia*

- 13 *Valeria*

- 14 *Centropogon ferrugineus*
 det. M. V.

- 15 edge of bush

- 16 *Fuchsia*

spreading over mud,
 calyx purplish red, ~~the~~ corolla
 bright yellow.

stems succulent, erect,
 calyx greenish red,
 corolla bright yellow
 erect, fls. white, buds nodding.

more or less diffuse, fls. ~~pink~~ magenta,
 buds nodding.
 shrub 3 m. tall, heads greenish ^{brown}
 rays white, leaves gray beneath.
 vine climbing in bushes.

fls. white
 vine-like shrub, climbing
 in bushes, corolla ^{leaves} orange,
 paler distally, column white,
 anthers black, stigma white
 fls. yellow.

erect shrub 1 m. tall, single stem
 growing up through bush,
 fls. pendent, deep magenta

20917

- 18 ~~Ma~~ Manettia
Climbing in bushes
19 Polypodium
rocks in bushes

20

edge of bush

- 21 Galium hypocarpium
edge of bush

Aug. 30 - same loc.

22 Galium

pasture with scattered subparamo
bush

Aug. 31 - Confluence of Rio
with Rio del Tiro. Mts.
wooded and bushy in bluff.

23

in dense wet woods, probably
a parasite but not certainly

24 Vaccinium

dense shade

25 Phoradendron

bushy place, parasitic

26

wet bushy woods

27 Vaccinium

bush, abundant

stiff tree-like shrub 3 m tall,

- fruit immature
- twining vine, fls. pinkish
- fruit immature
- somewhat pale beneath,
- rhizome very glaucous
fls. whitish, stems ascending

tending to form vine climbing
in bushes. fruits orange,
fleshy.

prostrate to ascending or climbing
in clump of bush.

magenta purple, tessellate
with peltate projections,
surface of mass under
these red-pubescent,
scrambling shrub, fls.
fleshy, pinkish.
red-purple, tessellate

fls. greenish-white, waxy.
bushy shrub, fruits
yellow-green.

70923

brushy place

29 *Vaccinium*

brushy place, abundant

30 *Vaccinium*brushy place common but
not in flower except this

31

brushy place, common

32 *Ladenbergia*

brushy place, occasional

33

brushy place, common

34

rocky bank of river

Sept. 1 - same loc. but below
Rio Arroz, west side of Rio Humadea
Meta

wooded river bluff

35 *Pernettya*talus cone below cliff, wet with
streamlets of water, common.36 *Miconia*sides of talus cone below
cliff, abundant.37 *Pernettya*

wet talus cone below cliff

leaves fleshy, yellow-green,
fls. greenish.- bushy shrub, fls.
pinkish-white.- weak shrub, fls. red,
waxy.- sparsely branched
shrub 1.5 m. tall, fruit
green.- shrub 4 m. tall, branches
erect, others seen up to
6 or 8 m. tall. leaves very
revolute.- sparsely branched shrub
1.5 m. tall, fls. greenish-red;
specimen from 2 plants.
small tree 5 m. tall.low spreading shrubs
1-1.5 dm. tall, fls. white,
fruit black when ripe.- fruits purplish, probably
not mature. shrub 1.5 m. tall.shrub 0.5 m. tall, fls. white,
ripe fruit black. Prob. same
as # 70935 but only one tall plant seen.

- 20933 *Nertera*
abundant ^{wet} on rocks below water-fall
- 39 *Rynchospora*
on wet talus cone below cliff
- 40 *Vaccinium*
epiphytic in tree, wet forest
- 41 *Saurauja*
wet thickets on rocks above river
- 42 *Vaccinium*
epiphytic on tree, wet forest
- 43
epiphytic on tree-trunks
- 44
wet forest
- 45
wet forest, occasional
- 46
wet forest, only one seen, terrestrial
- 47
wet forest, on fallen tree, only one seen
in flower.
- 48 *Palicourea*
wet forest, occasional
- 49 *Nertera granadensis*
wet forest, on ground, common
- 50
wet forest, on fallen tree trunks

prostrate, creeping, forming
a loose mat, leaves stiff,
appearing distichous, fls.
yellowish, fruit red, fleshy.
Seems to be distinct from *N. granadensis*.

vine-like shrub, infl. and
flowers wax-like, coral red.
slender sparsely branched
shrub 2.5 m. tall, inflorescence
pendent, fruit immature
vine-like shrub, inflorescence
red buds coral red buds
yellowish distally.

tree 6 m. tall, fls. brilliant
deep purple, stamens yellow
vine climbing on lower
branches of trees, flowers
pendant, orange.
fls. light bronzed green.

flowers bronzed green.

shrub 4 m. tall, fruit immature,
infl. pendent.
prostrate, creeping, forming
loose mat or mats, fruits
fleshy, red.
fls. bronze-purple.

20951 *Palicourea*~~open~~ bushy slope

52

wet talus cone at foot of cliff

53

Centropogon ferrugineus

wet talus cone at foot of cliff

54

open wet talus cone at foot of cliff, common

55

edge of opening on wet talus cone at foot of cliff, tall bush

56

Sept. 7 - ~~at~~ Confluence of Rio Arroyo with Rio Nevada to form Rio Humadera.Meta
the wooded bushy river bluff

56

Alnus

common along river banks

57

common near river banks, and in most wet places.

58

Sept. 7 - same loc.

Calceolaria mexicana ^{subsp.} ~~subsp.~~ *mexicana* Presl.
wet rocks by edge of river

shrub 2 m. tall, fruits immature.

weak shrub up to 1 m. tall, spreading, leaves grayish, rays white, disk yellowish. scrambling shrub, corolla orange, column white, anthers black, erect.

vine, fls. bright red.

"aliso"

tree 20 m. tall, 5 dm. thick, very sparsely leafy, conspicuous for this reason forming dense thickets, leaves more or less erect, up to 3 m. long, when sterile resembling some dictamnines, infl. 3 m. tall, but some seen twice as tall.

"servitana"

corolla yellow
det. Molau, 1982

- 20959 *Nertera*
rocks wet by splashing water
from river
- 60 *Vittaria*
on tree ^{trunk} near river
- 61 *Vaccinium*
in bush
- 62
on tree-trunk more or less in open
- 63
on tree-trunk more or less in open
- 64
^{abundant} on tree trunk more or less in open
- 65 *Phoradendron*
common on ericaceous shrubs
- 66 *Vaccinium*
bushy slope
- 67 *Schefflera*
bushy slope, occasional
- 68
bushy slope, edge of forest
- Sept. 2 - Paramo above confluence
of Rio del Nevado and Rio Arroyo
Meta
sub. paramo bush, open
because of grazing
- 69 *Vaccinium*
- 70 *Blechnum*

prostrate, mat-forming,
leaves stiff.

scrambling shrub, bracts
red, corolla pinkish white.
crisp

pendent

forming dense mat

terete, yellowish green,
berries white.

scrambling shrub,
fls. reddish.
tree-like shrub, 4 m. tall.

woody, vine-like, stiff,
fls. yellow.

shrub, forming tangled thicket
fls. wax-like, dull coral-red.
paler ~~at~~ at tips.

(photo)

erect trunk 1.5 m. tall, 1.5-2 dm.
thick, mostly of old leaf-bases and
scutes, sterile fronds horizontal or
drooping, fertile ascending.

20971

- 72 *Gentiana*
in clumps of grass + other plants
in grazed páramo.

- 73 *Spiranthes*
grazed páramo

Sept. 5 - Quebrada Negra, 17 km.
s.w. of Cabrera, Ti.

Mun. de Pandi, Cundinamarca

wet forest, ~~in~~

- 74 *Cinchona pubescens* Vahl
in small ravine, one tree seen.

- 75 *Solandra*
in second growth forest in
clearing.

Sept. 5 - Quebrada Negra,
15 km. s.w. of Cabrera,

Cundinamarca

wet forest on level plateau

- 76 *Cinchona officinalis*
one tree only seen.

6.2-22
6.2-25

- 77 *Nertera granadensis*
very common weed in recent
clearings.

Sept. 6 - Plateau 5 km. n. n.w. of
Cabrera on trail to San Jerónimo,
n. and e. of Rio Sumapaz,
Cundinamarca

shrub 8 m. tall. rays purple,
disk yellowish, turning
dark red-purple.

plant dark reddish green,
fls. pale purple.

roots fleshy, fls. white.

Anal. Bellis
g+c 0.9
c 0.5
qui 0.0-0.05
TCA 1.4

tree 12 m. tall, 10 cm. thick.
fls. pink, fragrant (bark sample)
~~scandent~~ scandent shrub,
fls. yellow.

Anal. Bellis
g+c 2.7
c 0.01
qui 0.7
TCA 2.5

sterile tree, 2 dm. thick, 15 m.
tall, old leaves crimson red
(bark sample)
prostrate, mat-forming,
fruit scarlet.

Trail from Cabrera to La Colonia
runs up the valley of Quebrada
Negra (confused in map with
Q. de Pueblo Viejo), through

wonderful tall wet forest. The sides of this valley are rather gently sloping, rather than steep, and the forest is much better developed than on steeper slopes. *Cinchona officinalis* occurs here, but, as indicated by sprouts in cut over places, definitely localized in "manchar" rather than generally distributed. There is no apparent reason for this sort of distribution.

Sept. 6 - Plateau 5 km n. n. w. of Cabrera, n. and w. of Rio Sumapaz, Mun. de Pandi, Cundinamarca
 Cleared of wet forest and grown up with second-growth brush.
 20978 *Burmeistera*

L 79 *Palisota*

L 80

L 81

L 82 *Fuchsia*
 common

L 83

L 84 *Palicourea*

L 84a *Palicourea*
 common

On both sides of the trail the forest is mostly cleared for a short distance, and a string of new finches are scattered along the trail. The clearing will likely go on rapidly till all of this is destroyed. In the cleared portion is brush about 3 m. tall, interlaced with vines. *Symbolanthus* is very common and conspicuous here, rather than scattered and rare as usual, all in flower.

Cinchona officinalis distributed locally here, as indicated by sprouts. *Symbolanthus* also common here and in bloom.

- sprawling shrub, fl. bronze-green, fruits purple.

- ~~herb~~ herb, up to 1 m. tall,

- fls. brilliant crimson-red.

- scandent shrub, rays white

- scandent shrub, fls.

- deep orange.

- scandent shrub, flowers

- scarlet, pendent.

- sub-scandent shrub,

- fls. white.

- shrub 3 m. tall, infl. and

fls. yellow.

L 20995

common.

- L 86 *Cinchona officinalis*
occasional locally

Sept. 7. - San Bernardo, ~~Rio~~
valley of Rio Negro, Cundinamarca
Roadside banks and thickets

L 2 87

abundant, moist places

L 2 88

thickets

L 3 89

thicket

L 3 90

Eupatorium

L 3 91

Galium hypocarpium
thicket

L 1 92

thicket

L 1 93

Castilleja

moist places, not common

L 4 94

Rubus

thickets

L 2 95

Mikania

thickets

L 2 96

Baccharis

thickets

sub-scarlet bark,

fls. yellow.

sterile stump sprout
4 m. tall.mesophytic region, thickly
populated and planted to coffee.
(photos).prostrate with ascending
branches, flowers yellow.shrub 2 m. tall, stems
and infl. with purplish
pubescence, fls. white,
fruit green.vine climbing in thicket,
buds whitish.erect herb 1.5 m. tall, fls. ^{fragrant} lavender.vine climbing in bush,
fruits orange, fleshy, fls.
greenish-yellow.vine climbing in thicket,
fls. yellow, fruit green.erect, calyx green, bracts
tipped with scarlet, pubescent,
glistening, whitish.vine-like, forming
tangles ~~several~~ 2 m. deep,
fls. pale pinkish, fruit
black when ripe, insipid,
not at all sweet.

vine climbing in bush.

fls. white.

woody vine, leaves appearing
distichous, flowers white.

20997

98 Solanum

99 Phytolacca

21000 Polygonum punctatum Ell.

det.
HCF.

01 Solanum

02

common

03

04

05 Drymaria cordata

06 Plantago

07 Galinsoga

08 Verbena

09 Bidens

10 Borreria

11

12 Lycopodium
dry bankserect herb, 1 m. tall, fls. white,
infl. purplish-brown.herb, 1 m. tall, buds with
purplish pubescence, fls.
white, fruit immature
(yellow and delicious when
ripe - the "~~stata~~" "lulo")coarse herb, stems
purplish, fls. magenta-pink,
fruits immature.weakly ~~erect~~ or
ascending, fls. white.
erect suffrutescent herb,
1 m. tall, fls. white.suffrutescent herb, up
to 1 m. tall, fls. deep yellow.
prostrate, hanging over
banks, petals white, entire,
styles white ? (n4)erect, fls. whitish.
prostrate, hanging over
roadside bank, herbage
dull green, inflorescences
ascending, fruiting
pedicels very sticky.infl. erect.
erect, rays white, disk yellow.
corolla lavender with
red tube. plant erect.
rays white, disk yellow.
fls. whitesprawling herb, fls. pale lavender.
fls. purple, roots yellowish

41013 *Astrephia clachrophylloides* (J. E. Smith) W.C.
det. S. Smith

14 *Pteridium aquilinum*
roadside

Sept

Aug. 9 - Rio Cuzja, 4 km. s. w. of
Fusagasuga, Cundinamarca
Coffee plantation.

15 *Alga*

Sept

Aug. 9 - Valley of ~~the~~ Quebrada
Malagana, road from
Bogotá to Fusagasuga, 14 km.
n.e. of Fusagasuga, Cund.

16 *Nertera granadensis*
moist road cut, common

17 *Vaccinium*

moist road cut

18 *moist road cut*

~~19 *Gunnera*~~

Sept

Aug. 9 - Valley of Quebrada
Malagana, road from
Bogotá to Fusagasuga,
15 km. n.e. of Fusagasuga, Cund.

19 *Gunnera*
wet slope by road

20 *Pernettya*
stream bank

21 *Tropaeolum*
slope above stream

spreading herb, fls. white
or pinkish white.
rhizome deeply buried

tree 5 m. tall, stamens white,
used as shade tree.

prostrate, fruits fleshy,
red.

prostrate, fruit light purple.

prostrate, hanging.

stem short, upturned.

fruit fleshy, purplish on
one side, whitish on other,
extensively creeping and
climbing vine, spur coral-red,
petals & sepals buff-yellow.

21022 *Alchemilla*

roadside near at sea

23 *Uncinnia phleoides*

roadside near at sea

Sept. 14 - pass between Alban and
Facatativa, 2 km above Alban,
Cundinamarca 2600 m

brushy slope, cut-over hillside

24 *Cinchona pubescens*

25 *Quercus humboldtii*

steep slope, patch of oak woods

26

parasitic on *Cinchona pubescens*

Sept. 14 - just above San Bernardo,
half way between Alban and Sasima
Cundinamarca.

second growth woods.

27

edge of road clearing

28 *Palicourea*

29

common

30 *Psychotria*

31 *Palicourea*

Psychotria

Palicourea

small tree 7 m. tall 1 dm.
thick, flowers mostly
dried, fruits immature
and others shattered. (bark sample)

fruiting tree 15 m. tall, 5 dm. thick

flowering tree 10 m. tall, 2.5 dm. thick
immature fruit orange,
mature fruit black.

Tall cane, 4 m. tall, growing

up through bushes.
fruit green infl. purple,
well shrub.

erect herb, fls. white

erect subshrub 2 m. tall,
fruit light purple.

shrub 2 m. tall fls. greenish-
white.

Sept. 19 - Falls of Tequenda ma,
Cundinamarca
slope just above falls

L 71032

Sept. 20 - ridge bet Rio Piedra
and Rio Guilaque 5 km. n.e. of
Dolores, Cauca.
thicket along fence at side of
road, cultivated land.

L 2 33

L 5 34

Croton

very common throughout region

7 km. s.e. Popayán

Sept. 26, # 2 w. side of valley of Rio
Guachicono, 8 km. n.e. of El
Bordo, Cauca

on weedy road embankment.

L 35

L 36

Borreria

L 37

abundant

L 38

L 39

L 40

Waltheria

common

L 41

tree 5 m. tall, fls. white
(same tree as # 21868)

shrubby tree 3 m. tall.
small trees 4-5 m. tall, others
much larger, old leaves
turning bright red.

prostrate, bracts green, fleshy

erect, fls. white.

heads whitish, plant 1 m. tall

erect, weak shrub 1.5 m.

tall, heads yellow

erect, lower leaves dead

and fallen, heads purple.

erect, up to 1 m. tall.

erect, heads whitish.

- 42 ✓ Sept. 27 - Morasuroo Ridge, 10 km.
n.e. of Pasto (km. 10 on road to
Popayan), Nariño
- L 21042 *Gunnera*
wet slope at base of cliff, comm. m.
- L 43 *Daucus*
wet roadside
- L 44 *Cuscutorium*
thicket above road
- L 45 *Drymaria cordata*
roadside thicket
- L 46 *Epilobium*
wet banks
- L 47
wet banks & cliffs
- L 49
wet roadside
- L 50
roadside
- L 51
wet slope, mud, abundant
- L 52 *Centropogon*
thicket above road
- L 53 *Solanum*
disturbed ground along road
- L 54 *Galium hypocarpum*
thicket above road
- L 55 *Centropogon leucophyllus* Gleason
thicket above road det. Mel.
- L 56 *Castilleja*
roadside thicket
- L 57 *Calceolaria mexicana* ^{Benth.} subsp. *mexicana*
wet base of cliff
- L 58 *Jesner*
crevices in cliff.

- rhizome short, prostrate
with erect
- spreading herb, fls.
- white.
fls. white.
- fls. purple
- fls. white with purple
- dots on lips.
prostrate, fls. white.
- fruits mostly shattered
- fl. orange, column white,
anthers black. scandent shrub.
fls. deep purple
- vine-like herb, fruit orange,
- fleshy.
- scandent shrub, flowers
- bright red., anthers deep purple.
- bracts & calyxes tipped with
- scarlet.
- prostrate, fls. yellow.
- pendent, fls. bright red.

det. Molau
1982

Sept. 23 - Cliffs n. of
Rio Bobo, 10 km. e. of Imaes,
25 km. s.w. of Pasto, Nariño
21059 *Hedyotis thymifolia*
road cut, crevices

Sept. 30 - Bridge across Rio
Bobo, Guaitará, at confluence of Rio Bobo,
6 km. e. of Imaes, 29 km. s.w. of Pasto, Nariño
dry cliffs above road.

60 *Tillandsia*
very abundant in rock crevices,
also seen on bushes and trees.

61 *Delaginella*

62 *Cheilanthes*

Oct. 1 - Rio Guabo, 3 km. below
Piedrancha, Nariño 1700 m.
63 *Sarapija*
fence-row in dry valley bottom

Oct. 1 - Rio Guabo, 8 km. below
Piedrancha, at Curculle area
just above San Miguel, Nariño
Wooded bottom of ravine 1550 m.
at foot of hills.

64 *Croton*

65

undergrowth

fls. white, corolla lobes patent

tufts.

forming thin mat, adhering
to rocks, spreading as
much as 0.5 m.
curled up when dry.

small tree 4 m. tall,
fls. white.

Cinchona pubescens common
here at foot of hills - good
sized trees, but mostly harvested.
stump and root sprouts common, especially
in cut-over areas.

shrub 4 m. tall, others form
trees up to 10 m. tall, old
leaves red.

shrub 1 m. tall, fl. white.

71066

along trail, partially shaded.

67 Solanum

in undergrowth, partially shaded.

68 Palicourea

undergrowth

69 Tournefortia

undergrowth

70

undergrowth

71

undergrowth

72

undergrowth

73 Myrsine

undergrowth

74 Boehmeria

undergrowth along stream

75 Hedysmum

76 Boreria

rocks along stream

77 Ladenbergia

slope

78

79 Bocconia

fls. orange red, orifice
of corolla small.

shrub 2 m. tall, fls. white.

fruit immature.

shrub 1.5 m. tall, fls. yellow,

infl. coral red, in fruit

turning yellow, fruits immature.

small tree, fls. white,

leaves conspicuously

reticulate - rugose

slender shrub 2 m. tall.

shrub 2 m. tall, ripe

fruits purple, ^{bluish} shiny, fleshy.

shrub or small tree 5 m.

tall, inflorescence pendent.

shrub 2 m. tall, fruit

immature.

shrub 2 m. tall,

infl. pendent.

tree 6 m. tall, aromatic when

broken, fruit white, fleshy.

fls. white.

"quina roja"

tree 10 m. tall veins reddish

beneath, buds white. (bark sample)

shrub 2 m. tall, bud

enclosed in hard gum.

"barniz de Pasto" used to

make a lacquer for wood.

erect shrub 3 m. tall, fruiting

inflorescence pendent, sap

orange, used to color clothes.

21080

parasitic on *Cinchona pubescens*
81 *Rondellatia*

82

undergrowth

83

84

85

parasitic on #21084.

86

Capricum

undergrowth

87

Cinchona pubescens Vahl

88

Ladenbergia

89

Cinchona pubescens Vahl

90

Vismia

edge of forest

"mata palo", said to destroy
coffee trees. dark green.

- small tree, 5 m. tall.

slender shrub 4 m. tall,

- fruit black, fleshy.

small tree, 5 m. tall,

- fls. white.

- small tree, fls. whitish.

fruit white, translucent,

- spherical. "mata palo". light green.

shrubs 2 m. tall, fruit

immature. fls. whitish.

wounded leaves used to cure

- fever and worms in children.

partially dead tree, ^{leaves} ~~dull above~~,

stipules green, turning red,

carinate, fruit immature,

- "guina amarilla".

slender tree 6 m. tall,

veins reddish beneath.

- "guina roja".

tree 10 m. tall, leaves dull above,

old ones red, fruits immature

(bark sample).

- small tree, leaves ~~very~~

coppery beneath. This

tree is said to grow from

the dead body of a worm.

The worm shown me was

a scarab larva which

had ~~fungus~~ a club-shaped

fungus growing from it.

In alternate years the beetle is

supposed to emerge, the other years

the tree.

Anal. Bellis
g+c 0.4
cin 1.4
T.C.P. 1.4

Anal. Bellis
g+c 0.4
cin 1.4
T.C.P. 2.3

21091

Coccythospermum

cut above trail at edge of forest

Oct. 1 - Piedrancha, Rio
Guabo, Nariño 1850 m.

92 *Micandra physalodes*
weedy vacant lot

93 *Buddleia*
weedy vacant lot.

94 *Tecoma stans*
garden, cultivated

Oct. 2 - Curucelo area, just above
San Miguel, ~~2 km. below~~ Rio Guabo
3 km. below Piedrancha, Nariño.
1950 m.

95 *Tephrosia toxicaria*
in cultivated ground

96 *Ixora*
in underbrush along ~~pasture~~ stream

97 *Begonia*
in underbrush along stream,
common in region up to 2000 m.

Oct. 2 - mountains 5 km n.w.
of Piedrancha, Nariño. 1950-2150 m.
rain forest on steep north slope

prostrate, fls. lavender,
fruit soft, ~~pear~~ pyriform,
blue.

herb 1.5 m. tall, fruit
yellow, said to cause
insanity if eaten.
- suffrutescent herb,
- fls. whitish.
- small tree 3 m. tall,
fls. bright chrome yellow,
fls. used for excessive
menstrual bleeding.

used as fish poison.

- herb 1 m. tall.
- shrub 2 m. tall, inflorescences
cauline, coral red, fls. orange-
red with yellow lobes.
- erect herb 5 m. tall, stem
very thick, fls. white.

A very hairy form of *Linchoma pubescens*
common in this area, mostly
small sprouts below, larger
trees common at 2000 m. on
west sloping ridge.
smooth form barely reaching 1900 m.

21098 *Schragocedrys hirsuta* 1900 m.

99 *Cephaelis axillaris* 2150 m.
in undergrowth, common

21100

in undergrowth, rare

01 *Cinchona pubescens* Vahl. 2150 m.
common ~~under~~

02

in undergrowth 2200 m.

Anal. Bellis
g+c 0.2
cin 1.3
quin 0.1
T.C.A. 1.2

03 *Cinchona pubescens* 2150 m.

04

undergrowth 2150 m.

05

climbing in *Cinchona pubescens* tree
06 *Cinchona pubescens* Vahl. 2100 m.

Anal. Bellis
g+c 1.3
cin 0.7
quin n.m.t.
T.C.A. 2.0

07

Cinchona pubescens Vahl 1950 m.
young shoots common, large trees not
seen at this altitude

08

Cyclanthus
occasional 1700 m.

small tree, 8 m. tall, many
seen but all sterile.

- suffrutescent herb 1 m. tall,
fruits blue, flowers white,
stems green.

- small weak shrub, flowers
green.

- tree 20 cm. thick, 12 m. tall,
old leaves red, fruits reddish.

Anal. Bellis
g+c 0.2
cin 1.3
quin 0.1
T.C.A. 1.6

(bark sample) "quina lanuda".

- shrub 1-5 m. tall, infl
purplish-red, berries

lavender. (veins reddish beneath).

- tree 10 m. tall, 15 cm. thick,

fruits reddish, old leaves

red. "quina lanuda" (bark sample)

- slender shrub 3 m. tall,

- fruits immature

- ~~herbaceous~~ herbaceous vine.

tree 10 m. tall, branched at base,
trunk cut 15 cm. in diam.

- "quina lanuda" (bark sample)

- young shoots ~~1-1.5 m. tall~~ 1-1.5 m. tall,
"quina lanuda"

- rhizome short, thick, apex erect.
leaves bifid to base, about
3 mature leaves on plant

✓✓ Oct. 3 - Quebrada Panacual,
8 km. S. of Piedra Negra,
Rio Guabo drainage, Nariño.
sparsely wooded, bushy ravine. 2800 m.

L 21109 Phytolacca

L 3 10 Fresia

L 4 11 Sipanea

L 12 Cinchona pitayensis
small mancha of five
or six young, sterile trees,
no seedlings.

L 13

L 14 Galium hypocarpium

L 15

L 16 on fallen tree
Palicourea

Oct. 3 ridge nw. of Quebrada
de Piedra Negra, 8 km. S. of
Piedra Negra, Rio Guabo, Nariño
dry burned over steep slope. 2800 m.

L 17

common in dry part of ravine

low spreading coarse
herb, fls. magenta-pink,
berries black when ripe.
herbaceous vine scrambling
over bushes.
shrub 4 m. tall, with
lemon-grass odor, leaves
very rugose, fls. greenish-
yellow, fruits spherical,
covered with soft projections,
rose-colored.
tree 3 m. tall, 1 dm. thick,
only branched near top,
leaves green, somewhat
lustrous above (bark sample)
erect suffrutescent herb,
fls. yellow.
vine-like, fruit fleshy, orange.
fls. rose-pink

Anal Bellis	
942	1.4
cin	2.5
pin	1.0
T.C. 19	4.9

erect shrub 4 m. tall,
infl. deep blue, fruit green.

tree 5 m. tall

21118

Vaccinium

dry part of ravine

L 19

dry part of ravine

24

Oct. 3 - ridge sw. of Quebrada
de Pueblo Viejo, 6 km. s. of
Piedra Blanca, Rio Guabito,
Nariño 2800 m.

L 20

Alnus

abundant from here down
to river, dry burned-over slope.
most plants appear dead
from fire.

L 21

vertical rock outcrops

L 22

Gunnera

colony around spring
in brake of very tall Chusquea

2700 m.

L 23

Solanum tuberosum

cultivated (with #21124)

L 24

Solanum tuberosum

cultivated (with #21123)

2300 m.

2300 m.

low spreading bush,
fruit translucent, white.
tree 6 m. tall, fruit
black when ripe.

shrub 1.5 m. tall.
"alias"

densely caespitose,
have been burned so
all shoots are new,
fls. flame-red.
rhizome short, almost erect,
some gelatin at apex,
apex of rhizome when cut
shows what appears to
be symmetrically arranged
columns of blue-green algae
within the tissue;
leaves ascending,
somewhat funnel-
shape, infl. purplish.
3-4 mature leaves on plant
fls. purple "papa"

fls. white "papa"

- 21125 *Hedyotis*
dry slope, along trail in
disturbed place
- 26 *Hedyotis*
dry slope, sparse bush
- 27 *Hedyotis*
dry slope, cut above trail

✓ Oct. 3 - Rio Guabo, mouth
of quebrada de Pueblos Viejos,
4 km. s.e. of Piedra Blanca, Nariño

- 28 *Alnus*
thickets at foot of
steep slope, abundant
- 29
dry river-bottom or "vega"
- 30 *Alnus*
dry bank of river, abundant
- 31
dry river-bottom or "vega"
- 32 *Psidium guineense*
dry pasture
- 33 *Hedyotis*
dry lower slope, common
in rain-burned places
- 34 *Eugenia*
common on brushy lower slope
- 38
on tree trunks on river-bank

- 2350 m. small shrub, fls. white.
- 2250 m. low spreading, ~~and~~ rigid
spiny bush, ^{all} fls. white,
fruit immature
- 2250 m. small shrub, fls. white.
- 1975 m. shrub 5 m. tall, "aliso"
- 1950 m. small tree 4 m. tall,
fruit black.
- 1940 m. shrub 2 m. tall "aliso"
- 1950 m. shrub 5 m. tall, branches
ending in tufts of ~~leaves~~
looking like *Rhus*, fls. pendent,
white.
- 2050 m. low bush 1 m. tall, fls. white.
- 2050 m. small bush, fls. white.
- 2000 m. small box-like trees,
2-5 m. tall, fls. white,
leaves dark green.
- 1940 m. caespitose, sepals bronze,
petals white

- Oct. 4 - n.e. ridge Volcan Gualacala, about
3 km. n.e. of summit, 18 km. s. of
e. of Piedrancha, Nariño
sharp boundary bet.
paramo and subparamo

21137

Hedyotis

abundant at upper edge
of subparamo.

36

vertical mossy cliff

- Oct. 4 - head of Rio El Cristo
4 km. n.e. of summit of Volcan
Gualacala, 18 km. n. of e. of
Piedrancha, Nariño,
scrubby forest 3000 m.
38 *Palicourea*

- Oct. 4 - Upper Rio ^GGualacala
5 km. n. of summit of Volcan
Gualacala, 17 km. e. of
Piedrancha, Nariño,
scrubby forest overgrown 2700 m.
with *Chusquea*

39

Nertera granadensis
on trail

- Oct. 4 - Upper Rio ^GGualacala, 5 km.
n. of summit of Gualacala,
17 km. e. of Piedrancha, Nariño
2600 m.

40 *Galium hypocarpium*
pasture, mossy bank

shrubs up to 0.5 m. tall,
fls. pinkish purple
outside, whitish within
fls. greenish-yellow.

shrub 2 m. tall, infl. yellow,
fls. white, waxy. fruit
dark blue, mostly shed.

prostrate, fruit orange

fruit orange, fleshy

- 21141 *Nertera granadensis*
vertical mossy bank in clearing

Oct. 5 - Upper Rio Hualcala, 5 km.
n. of summit of Volcan Gualcala,
17 km. e. of Piedrancha, Narino
steep slopes above stream 2500 m.
densely overgrown with Chusquea
42 *Gunnera*
along trail

prostrate, fruits range to
red.

rhizome ascending 4 dm. long
3-4 leaves on plant, leaves
rugose above, infl.
almost horizontal.
This plant is about
average size others twice
as large and very much
smaller. Fairly uniform
here in leaf outline, becoming
— more deeply lobed
more scabrous above
but perhaps all one
species, up to # 21164
in the upper edge of
sub-paramo 1000 m. above,
Uniformly more slender
than others I have
seen of same affinity.
Petioles and inflorescence
slender. Bud smaller
with few bracts. All
plants in fruit, this
one with fruit green, others
red.

Oct. 5 - Headwaters of
Quebrada (Rio) de El Cristo,
4 km. n.e. of summit of
Volcan Gualcala, 18 km.
n. of e. of Piedra Blanca, Narino
sparse wet forest with
much underbrush.

21143

Melast.

common in undergrowth

L 44

in second growth brush.

45

in second growth brush

46

Passiflora

in second growth brush

47

vertical banks above trail

48

Cinchona pitayensis

49

Palicourea

50

Cinchona pitayensis

51

in humus, barely emerging

Cinchona pitayensis is fairly
common and distributed in the
forest between about 2900-3000 m.
the larger trees, up to 25 cm. thick
being practically all harvested.

Hundreds of saplings or sprouts
up to 5 cm. thick remain. all slopes.
low shrub up to 1 m. tall

2700 m.

calyx and infl.

yellow.

2800 m.

elongate shrub, fruit
vertically compressed or
flattened.

2900 m.

vine fls. yellowish
white, leaves somewhat
thick.

2900 m.

vine, leaves slightly
glaucous beneath, fls.
pendent, calyx and
corolla light magenta
corona of white warts
on a purple ring. "tausa"

2900 m.

stiff caespitose herb
1 m. tall, fls. deep orange.

2900 m.

young plant, possibly a
root-sprout, 4 m. tall, sterile.

2900 m.

shrub 2 m. tall, infl.
blue-black, fls. blue,
fruit blue-black.

2900 m.

very young plant, less
than 1 m. tall, leaves very large

2850 m.

~~peltate~~ appendages
forming a tessellated surface,
these rose-pink, head spherical.

- 21152 *Cinchona pitayensis*
small group of trees
53 bottom of ravine
- 54 *Cinchona pitayensis* Wedd.
sloping side of ravine, common.
- 55 *Grnellia*
top of ridge
- 56 *Cinchona pitayensis* Wedd.
- 57 *Cinchona pitayensis* Wedd.
bushy clearing
- Oct. 5 - N.E. ridge of Volcan
Gualcala, 2-3 km. N.E. of
summit, 13 km. S. of E. of
Piedra Blanca, Narino
- 58 *Hedyotis*
transition bet. forest and subparamo
common from here to top of
subparamo.
- 59 *Palicourea*
upper edge of forest
- 60 *Bomarea*
sub-paramo, common

- 2950 m. small, much-branched
sterile tree, more or less
2950 m. sprawling, 6 m. tall
herb 1 m. tall, calyx reddish
green, corolla with small
opening, yellow above, red
beneath
- 2950 m. tree 12 cm. thick, 15 m. tall.
branched only at top, old leaves
red, lower glossy above,
fls. deep purple with white
hair, fruits in all stages
of maturity. bark ^{white} turning
red-brown quickly when
cut. (bark sample)
- 3000 m. tree 6 m. tall.
- 3100 m. young tree 4 m. tall, sterile
- 2900 m. stump sprouts 1 m. tall.
- 3150 m. fls. pinkish-lavender
outside, white inside
shrub 7 dm. tall
- bush 1.5 m. tall, infl. blue-black
fls. dull blue.
- 3200-3500 m. sepals vermillion, petals
yellow spotted with purple,
fruit yellow, globose.

21161

Senecio

subparamo, also common in paramo

62

upper edge of subparamo

63

Blechnum

common in subparamo, also
in forest below.

64

Gunnera

upper edge of subparamo
apparently upper extreme
of # 21142, but much
smaller, ^{leaves} much more

65

Oct. 5 - ^{upper} slope of Volcan
Gualacaopen steeply sloping 3500-3600 m.
paramo with grass and
Espelletia the principal components
of the vegetation.

66

Espelletia

common

67

Lycopodium

hanging over cut bank above trail

68

Acaena

clumps along trail

shrub 1 m. tall, leaves
glaucous, heads yellow,
erect in flower nodding
in fruit.shrub 1 m. tall, corolla
orange, column whitish,
anthers blackish.
sterile fronds prostrate
fertile ones erect, rhizome
short, thick.rugose and
scabrous, infl. much more
dense.forming a dense hummock,
fls. whitish, fruit purple-
brown.caulescent, up to 2 m. tall
infls. ascending, heads
yellow.

prostrate, spikes erect

bushy, 0.5 m. tall.

- 21169 Valeriana
common
- 70 Vaccinium
common
- 71 Castilleja
common
- 72 Peinettia
common
- 73 scattered along disturbed
bank above trail
- 74 Peinettia
common
- 75 cut bank above trail, one plant
seen

Oct. 5 - near Guachigüe, s. e.
slope of Volcan Gualcala.
15 km. e. of Guachigüe Paramo
3500 m.

- 76 Loasa
thickets along trail, near
cultivated ground in paramo
- 77
- 78 Baccharis
grazed place in paramo

Oct. 6 Oscurana, village on s. slope
of Volcan Gualcala

3150 m.

- 79 Cult. in garden, said to have been
transplanted from paramo nearby.

- slender shrub 0.5-1 m. long,
sprawling, fls. white
almost prostrate, berries
blue.
- tips of bracts red, calyx
green, corolla yellowish
distally
- low shrub, fls. white
- shrub up to 0.8 m. tall.
fls. gray, drying on plant
- low bushes, fruit black.
- small bush, fls. yellow.

- spreading stinging herb
up to 1 m. tall, fls. orange
- fls. red, ripe fruit black.
heads whitish

- shrub 2 m. tall, leaves pungent
fls. red-orange.

21180

cult. in garden

81 Lathyrus

cult. in garden

82 Breconia

thickets around cultivated ground

83

cult. in garden

84 Calceolaria lamnifolia HBK. 221 m. tall
roadside

85

thickets in ravine

86 Fuchsia

common in second-growth brush
throughout region.

87 Myrsotis

roadside

88 Mutisia

thicket in ravine

Oct. 6 - slopes of Volcan Guadalupe
above Mallama,

Nariño.

second growth brush

2800 m.

89 Tournefortia

90

common throughout region

91 Pilea

fls. dull orange

fls. deep rose-purple

shrub 3 m. tall.

fls. magenta

fls. sulfur-yellow

herb 2 m. tall

shrub 2-3 m. tall, fls.

pendent, vermillion,

buds greenish-tipped.

fls. lavender.

herbaceous vine climbing
in trees and bushes, heads
pendent, rays bright scarlet.

spreading bush, 1 m. tall

fls. purplish-white.

shrub 1 m. tall, fls.

magenta

erect, 1 m. tall, infl. purplish.

Oct. 6 - slopes below Mallama,

- Nariño
- 21192 *Hedyotis* dry bushy, burned ^{over} slopes. 2475 m.
common on dry slopes
- 93 *Lantana* 2450 m.
trail-side
- 94 *Miconia* 2300 m.
common
- 95 *Ambrosia* 2300 m.
- 96 *Hedyotis* 2150 m.
common on dry slopes up to 2475 m.
- 97 *Mimulus*
mud where trail crosses rivulet

Oct. 9 - Mongón, 20 km. e. s. e.
of Barbacoas on Rio Telembi,
Nariño

- 98 *Gonzalagunia* slopes and cliffs just above river 50 m.
wet cliff
- 99
wet cliff
- 21200 *Conyza*
wet cliff, abundant
- 01
weedy slopes at base of cliff
- 02
weedy slopes at base of cliff
- 03 *Conyza*
weedy slope

- fls. white, lobes patent.
- suffrutescent herb,
fls. pinkish-purple.
- Used medicinally.
shrub 2 m. tall,
- fruits purple.
- shrub 2.5 m. tall.
fls. white, lobes patent.
- prostrate, fls. yellow.

- shrub with long pendent ^{fleshy} stems,
spikes pendent, fruit white,
shrub 1 m. tall, fls. whitish.

- shrub up to 4 m. tall, fls.
white, fruit bladderish.
- twining vine, flowers
whitish, fruit red, fleshy.
- herb, m. long, fls. whitish,
in small scorpioid cymes,
odor of plant musky when
broken.
- bushy herb, heads white.

21204 *Cuphea*
rocks at base of waterfall
wet with spray

Oct. 9 - same loc.

150m.

Tops of low hills above
river bluffs, dense
tall ~~forest~~ rain forest
with a clay-like soil,
little humus and little
underbrush.

05 *Faramia*

06

07 *Faramia*
common

08 *Cephaelis*
common

Oct. 10 - high ground ^{and river margin} south
of Barbacoas, along Rio Guagui,
Maricao
second growth ^{wet} woods 40-50m.

09 *Cephaelis*
not common, growing with #21200
on higher ground.

bush 0.5 m. tall,
fls. pinkish.

* slender shrub, fruit
greenish-black.
small tree 6 m. tall,
ripe fruits dark blue
said to be called "capitans"
in Choco and used for fevers.
small tree, 6 m. tall
fls. pale blue-lavender,
fruits lavender when ripe.
infl. white.
weak shrub up to 2 m.
tall, bracts bright red,
fls. ~~whitish~~ ^{yellowish}, fruits
dark blue, glossy.
blue-black, glossy.

soil clay-like, little
humus.

brittle suffrutescent herb
up to 2 m. tall, bracts brick
red, fls. white.

21210
9*Cephaelis*high ground, common, growing
with #21209.

5 11

*Palicourea*bush at top of gravel
beach, vega of river

7 12

arb.

crotch of tree along river

L 13

Coccyzpselum

under trees on high ground.

L 14

Rub.

in bush on high ground

3 15

*Diodia*wet ground, somewhat open,
near stream

Oct. 11 - trail west of Pimbi,
between Pimbi and Rio
Telembi, 10-15 km. S. of
Barbacoa, Nariño. 52 m.
dense bushy woods, clay-like
soil with streaks of
gravel.

5 16

indg. = p.

L 17

Vaccinium

suffrutescent herb up to 1.5
m. tall, fls. yellow, fruits
bright blue, pyriform,
fleshy, not glossy,
bracts scarlet, becoming
orange in age.

- scandent shrub up to
4 m. tall, infl. coral red,
fl. common yellow, f. immature.
- leaves grass-like, flowers
white, marked with purple
inside.
- prostrate, fls. lavender,
fruits fleshy, bright blue.
- woody vine.

weakly ascending herb,
(others seen climbing
as much as 2 m. in bushes)
fls. white.

up to 10 m. tall, leaves
light green, under parts
dark greenish below
new branches from tree
or onto plants.

Oct 11 - Rio Focumbi 10 km
e. of Barbacoas, Narino
~~bank~~ bank of river at
mouth of muddy cut,
sometimes submerged 40 m

41317 Psychotria

" common on steep bank

Oct 11 - Pimbi 15 km. e. of
Barbacoas, Narino 1000
clearings in wet forest.

41318 Palicourea ligula - 10 m
common along trail

41319 Monarda

Oct 11 - 1 km north of Pimbi,
15 km. e. of Barbacoas, Narino
dense wet forest. 50-75 m.
in clay - also soil containing
some granite.

Cinchona barbacensis

Top of small ridge, only
one small colony seen.

Anal. Bellis 1
G+C n.m. tr
Lir n.m. tr
Qui n.m. tr

28

shrub, 1.5 m tall, pale
white, fruit red when ripe

Shrub up to 1.5 m tall,
some ad. with pinkish
- fruit immature
- fruit red when ripe 1.5 m.
tall, branches red-purple,
fls. white, fruit black
when ripe

Shrub up to 1.5 m tall,
seems apparently from
a young seedling of
stem which has decayed
and broken branches
up to 1.5 m long, woody
and tangy at mouth of
small trees, all not
more than 4-5 cm. thick.
Bark pinkish, very hard
and, especially at base
ripe. Stem producing
aerial roots. Bark very bitter,
pale (small)

2137

- 4 23

wet ground along road

24 Lycopodium

side of ravine above stream

A. J. Bell's
 9+10-11
 C. J. Bell's
 9+10-11
 10/11/47

Psychotria

side of ravine

25 Lycopodium

27 Diodia ocimifolia (Willd.) Brem.

side of trail

28 Calceolaria

shrub on

Oct. 13 -

100 m.

rather scrubby, bushy wet woods, clay soil.

29 Panicum

wet seep in old quarry

30 Jussiaea

trickle of water in old quarry

31

common in open wet places

32 Polygala

wet banks along road

33 Utricularia

wet places along road

34

rare, moist banks.

shrub 4 m tall, fls. bluish
 can. somewhat erect up to
 0.8 m tall fls. white.

very fragrant.

slender shrub.

sparsely branched.

slightly aromatic

little herb, fls. whitish.

small tree 5 m tall,

bark purple, fruit

blue, fleshy.

fls. white.

shrub 4 m tall,

infl. coral red fls. yellow.

2 white

2 white

leaves dark green, fls.
 white, roots with wintergreen
 erect, fls. yellow.

fl. white.

127
4 23

wet ground along road

1 26

Lepanthes

sides of ravines above stream

~~And-Bells~~
9+10-11
Cm. 141
Que. n. m. 52
28 04

Psychotria

sides of ravine

4 26

Euphorbia

1 27

Diodia octarifolia (Willd.) Bren.

sides of trail

1 28

Pellaea

stream bank

Oct. 13 - 3

1 29

Panicum

wet seep -

1 30

Jussiaea

trickle of r

1 31

common

1 32

Polygala

wet banks along road

1 33

Utricularia

wet places along road

1 34

rare, moist banks

shrub 4 m. tall, pro. branch
erect, somewhat thick up to
10 cm. tall, fls. white,
very fragrant.

smaller shrub,
sparsely branched,
slightly aromatic
bitly herb, fls. whitish.

small tree 5 m. tall,
bark purple fruit
blue, fleshy.
fls. white.

shrub 4 m. tall,
inf. coral red fls. yellow.

prostrate

petals white

leaves dark green, fls.
white, roots with wintergreen odor
erect, fls. yellow.

fl. white.

21 23
24 23

wet ground along road

25 24

Lepanthes

side of ravine above a trail

~~Ad. Bell's~~
~~9+10. m. 15~~
~~km. 0.41~~
~~9.15 m. 5~~
~~pt. 0.4~~

Psychotria

side of ravine

26 26

Cephaelis

27 27

Diodia octimifolia (Willd.) Brem.

side of trail

28 28

Palicourea

shrub on

Oct. 13 - 3

100 m.

rather scrubby, bushy wet
woods, clay soil.

29 29

Panicum

wet seep in old quarry

30 30

Jussiaea

trickle of water in old quarry

31 31

common in open wet places

32 32

Polygala

wet banks along road

33 33

Utricularia

wet places along road

34 34

rare, moist banks.

shrub 4 m. tall, fls. bluish,
erect, somewhat stiff up to
0.8 m. tall fls. white,
very fragrant.

smaller shrub,
sparsely branched,
slightly crossable
tuber herb, fls. whitish.

small tree 5 m. tall,
bark purple fruit
blue, fleshy.
fls. white.

shrub 4 m. tall,
infl. coral red fls. yellow.

prostrate

petals white

leaves dark green, fls.
white, roots with wintergreen odor,
erect, fls. yellow.

fl. white.

21235

Thickets on roadside

36

along trail

37

common in second growth

38

in opening

39

common in woods

40

Psychotria
dense shade

41

Lycopodium
in openings

42

common everywhere in wet open
places.

43

common in shade along
trails

44

shaded wet places

45

Blechnum
common

46

Hedyosmum
common

47

wet banks along road

herbaceous vine, fls.
white, fruit red-purple,
fleshy.- weak herb, 1.5 m. long,
fls. purple.- small tree 6 m. tall,
fls. white, fruit immature.
vine- bushy tree, fls. white
ripe fruits dark blue
ripening at different
times in same cluster.
fls. whitish, rhizome
brittle, fleshy, shoot
erect, infl. on erect
peduncle.
- scrambling

prostrate, fls. yellow.

fl. ^{dull} greenish white.- branch forming a liana
several to many m. long.
faintly aromatic.
- small tree, 6 m. tall.
aromatic herb, stems
sharply quadrangular,
fls. blue-violet.

Oct. 14 - 1 km. n. of Juvén,

21248 wet forest
Ladenbergia

Narino
about 2000 m.

Oct. 15 - slope above Laguna de la Cocha, on road to Lacts, just east of the summit, Putumayo sub-paramo brush, 3200 m. much Chusquea sp.

49 Centropogon ferrugineus

50 Nertera tetrasperma HBK.
banks and open ground by road, abundant

51 open flat ground by road, common

Oct. 15 - Encano, Laguna de La Cocha, Putumayo 2800 m. steep slopes above village, soil with deep duff layer and much humus in or thick (0.4 m.) layer beneath, cleared for potatoes, ullucos, etc. Linchoma ^{pidaguenis} was once common here. The stumps are common and all have clumps of sprouts. Many

tree 10 m. tall, 20 cm. thick, fruits pendent.

weak shrub, fls. deep orange, column white, anthers blackish.

prostrate, leaves stiff. fls. yellowish, fruits fleshy, dark red when ripe, skin tough, pyrenes 4.

prostrate, fls. white.

of the stumps have been felled to the ground but the leaves are still green. Probably the roots will eventually starve. Almost all are heavily infested and damaged by a caterpillar.

Mazures Ridge, 10 km.

✓ Oct. 16 - Chacapamba
n.w. of Pasto, near highway to Popayan
Nariño 2800 m.

- 21252 *Cinchona pitayensis*
cleared slope, common
53 *Cinchona pitayensis*
forest on south slope

Oct. 16 - Hills s.w. of Chachaguri,
n. w. of Pasto, Nariño.
second growth woods. n.w. slope. 2100 m.

- 54 *Larrea*
55 *Cinchona pubescens* Vahl

- 56 *Guettarda*
57

- 58

Anal. Bell's

from branches

Q+C n.m. tr

cin 0.3

qui n.m. tr

T.C.H. 0.3

from trunk

Q+C n.m. tr

cin 2.2

qui n.m. tr

T.C.H. 2.2

✓ 59 *Cinchona pubescens* Vahl.
steep slope

✓ Oct. 19 - La Cruz Nariño
cultivated in plaza

- 60 *Populus*
sterile, branches very short
61 *Podocarpus*

stump sprouts, growing
vigorously in cleared land.
tree, fruit immature.

Anal. Bell's

Q+C n.m. tr

cin 0.4

qui n.m. tr

T.C.H. 0.4

- shrub 2.5 m. tall, fls. white.
- slender stump of sprout
4 m. tall. veins of leaves
reddish. (bark sample)
- sterile shrub 3 m. tall.
- slender shrub, fruit
immature.
- vine climbing in trees.
- fls. greenish, fruit red.
- tree 6 m. tall, branched
at base into 3 trunks
about 10-15 cm. thick, leaves
with red veins (bark sample.)

long branches and
small (10 cm. long)
small tree said to have
been brought from nearby
forests.

✓ Oct. 19 - La Cruz, Narino, 2300 m.
along weedy trail ~~in~~ low
second-growth brush on
top of dry ridge of volcanic ash
Hed. petio.
shaded dry bank

63

64

65

Vaccinium

66

dry vertical earth bank.

67

Pellaea

dry vertical earth bank

68

Cheilanthes

dry vertical earth bank

69

Pellaea ternifolia

dry vertical earth bank

70

Blechnum

Oct. 20 - ridge between
Rio Tajumbina and quebrada
del Salado, 5 km. e. of Volcan
Doña Juana.

Narino, 3000 m.

wet ridge, upper part wooded,
lower cleared in pasture,
with bushy fence-rows.

21270 a asplenium
dry vertical earth bank

shrub 3-4 dm. tall, fls.
white, pinkish outside.
low spreading shrub,
fls. vermillion without,
orange within, column coral,
anthers tan.

suffrutescent herb up
to 1 m. tall, fls. magenta.
leaves 4-ranked.

spreading shrub up to
1 m. tall, fls. deep coral
red with green tips,
bracts pinkish green.

Cinchona pitayensis
is occasional here, mostly
saplings, as all larger
trees have been cut for
bark. Over a ton of wet
bark has been taken out
in tiny lots since Sept. 6.
Most of plants show a trace
of pubescence on petioles, veins etc.

- 212702 *Fuchsia*
brushy fence-row in
pasture.
- 71 *Palicourea*
common in brushy fence-rows
in pasture.
- 72 *Calceolaria lehmanniana* Kränzl.
along trail in forest
- 73 *Cinchona pitayensis*
steep e. slope
- 74
level ridge top.
- 75
on log in forest
- 76 *Palicourea*
common in forest.
- 77
on log in forest.
- 78 *Cinchona pitayensis*
dense forest on steep east
slope, deep humus.
- 79 *Cinchona pitayensis*
dense forest, steep east slope
- 80 *Cinchona pitayensis*
dense forest, steep east slope,
deep humus.

- shrub 2.5 m. tall,
infl. drooping, hypanth.
rose-color, sepals reddish-
green, petals bright crimson.
- shrub 3-4 m. tall,
fls. dark purple outside,
pale lavender within,
fruit immature. infl. yellow
fl. white, sometimes
with purplish tinge.
- sapling 3 m. tall,
leaves with conspicuous
pits in axils of ~~leaves~~ veins.
- herb up to 0.7 m. tall,
buds orange, corolla
pale cream-yellow, funnel-
form, infl. drooping
somewhat, fruit immature,
sepals ^{petals} maroon-purple,
lip white.
- shrub 2 m. tall, infl.
blue-green, ripe fruit
dark blue.
- fls. whitish.
- sapling 4 m. tall, sterile,
twigs 5 cm. thick (bark sample)
(bark sample) (bark peels easily)
- sapling 2 m. tall
- sterile sapling 6 m.
tall, 6 cm. thick (bark
sample, peels easily)

det Molau
1978

Anal Bellis
g+c 1.7
cin 2.4
gum 0.5
T.C.A 4.6

Anal Bellis
g+c 2.1
cin 2.1
gum 0.4
T.C.A 4.6

Oct. 21 -

2 km. above San Bernardo,

Nariño 2200 m.

- 81 *Cinchona pubescens* Vahl
edge of ravine above stream
in flat valley bottom, gravelly
soil.

Anal Bellis
g+c n.m. to
cin 1.2
quin n.m. to
T.C.A. 1.2

Oct. 21 - ^{stop} side of valley of
Rio Quina, across from
San José, Nariño 2000 m.

- 82 *Cinchona pubescens* Vahl
steep cleared slope, thickets
of second growth.

Anal Bellis
g+c n.m. to
cin 2.6
quin n.m. to
T.C.A. 2.6

Oct. 21 - 6 km. e. of La Unión
on road bet. La Unión and
Cartago, Nariño 2030 m.

- 83 *Cinchona pubescens* Vahl
roadside on steep slope
in open.

Anal Bellis
g+c 0.4
cin 1.7
T.C.A. 2.1

Oct. 22 - 5 km. s. of Timbri

Cauca

thicket along ravine,

1850 m.

second growth

- 84 *Cinchona pubescens* Vahl

Anal Bellis
g+c n.m. to
cin 0.6
quin n.m. to
T.C.A. 0.6

Oct. 23 - 6 km. n. of Popayán,

Cauca

pasture with second growth along ravine, 1850 m.

- 85 *Cinchona pubescens* Vahl
common in small second
growth along road near stream

C. pubescens occasional in thickets
+ along ravine banks in valley bottom

15 cm. thick,

tree 6 m. tall, leaf veins
reddish, (bark sample;
tree injured both by bees
and by chortyping).

C. pubescens occasional, but
most of region cleared. ^{occurs bet.} 6400 - 7400 ft.
tree 8 m. tall, 15 cm. thick,
fls. fragrant, coral red
outside, pale pink inside.
(bark sample)

C. pubescens common in patches
of second growth + along roadsides.

tree 10 m. tall, 20 cm. thick,
sterile. (bark sample)

Cinchona pubescens common,
good sized trees, up to 15 m.

tree 7 m. tall, 12 cm. thick,
old leaves red (bark sample)

sapling 4 m. tall, fls. pink,
fragrant.

- Oct. 26 Rio Santo Domingo, 12 km.
e. of Tacueyo, w. slopes of
Nevado del Huila, 21 km.
e.e. of Corinto, Cauca
rain forest on steep slope
- 21286 *Cinchona pubescens* Vahl

- 87 *Cinchona pitayensis*
friable gray-brown soil
with thick druff layer

88

89

on log
90 *Galium*

partially cleared rain forest

91

Oct. 27 same loc.

- 92 *Cinchona pubescens* Vahl.
steep slope on wall of canyon

- 93 *Cinchona pitayensis*
steep slope on wall of canyon

94 *Pilea*95 *Uncinia*

canyon wall

Hymenophyllaceae and
tree ferns surprisingly scarce.

2800 m.
Anal Bellis
q+c 0.4
cin 2.2
T.C.A 2.6

2960 m.
Anal Bellis
q+c 2.0
cin 2.3
T.C.A 5.0

2800 m.

2900 m.

2700 m.

2800 m.

Anal Bellis
q+c 1.6
cin 1.1
T.C.A 2.7

Anal Bellis
q+c 1.9
cin 0.6
quin 0.8
T.C.A 6.3

tree 15 m. tall, 3 dm. thick
leaves green, fruit
mostly immature
(bark sample)

small sterile sapling,
5 m. tall, 6 cm. thick
(bark sample)

fls. white

fls. white, fragrant

roots orange, plant
prostrate
forming loose tangles
slender shrub, 4 m. tall,
fruit green.

tree 15 m. tall, 3 dm. thick,
fls. pink, fragrant
(bark sample)

tree 10 m. tall, 1.5 dm. thick,
fls. purple, green fruits
much larger than dry ones
(Davis says there is a flower blight)
(bark sample).

erect herb 1 m. tall
tufts

21296 *Bolrychium virginianum*
"vega" a bend, along river, rare.

97 steep slope

98 *Psychotria*
near stream, along trail

Oct. 27 - same loc. 10-11 km. s. Tacueyo
cleared part of valley
young second growth

99 *Galium hypocarpum*

21300 *Daucus*

01 *Drymaria*

02

03 *Myrica*

04 *Gonzalagunia*

scattered in pasture, valley bottom

05

06 *Fuchsia*

07 *Liparura*

Oct. 28 - Rio Palo bet. El Palo
and Tacueyo.

Cauca 1500 m.

08 *Tephrosia toxicaria*

common on brushy cleared steep
slope.

tree 10 m. tall, 10 cm. thick,

- corolla green.

- herb 1 m. tall, fls.

greenish white

vine-like, fruit orange, fleshy,
"cicuta" said to be very poisonous.

- prostrate to ascending.

- plant grayish, fls. white

- herb 1 m. tall, fruits

- fleshy, white.

- shrub 3 m. tall, almost
odorless.

- bush 2.5 m. tall, fls.

- whitish, fruit gray, fleshy.

- shrub 2 m. tall, fls.

- yellowish green.

- shrub 2.5 m. tall, fls.

- scarlet.

- shrub 2.5 m. tall, fls.

- yellow, fruit rose-pink.

- plant unpleasantly
aromatic.

erect herb, up to 1 m. tall,
roots thick, woody, fls. cream-white,
variable to reddish. (root sample)

Oct. 29 - Palmira, El Valle
grounds of experiment
station, cacao plots. 935 m
21309 *Theobroma cacao* L.

L 11 10 *Theobroma bicolor* H. & B.
(said to have been brought
from the Chocó.)

The two above species may
be distinguished by the
T. cacao

habit	spreading
leaves	oblong, green on both sides,
infl.	scarcely palmately veined at base
fls. color	so reduced as to be fasciculate, on old wood.
petals	cream
	3 mm. long, with yellow terminal appendage 6-7 mm. long, strongly clawed
stamen	3 mm. long
staminode	9 mm. long, linear, anistate, erect
pistil	4 mm. long, red red-papillate
fruit	glabrous, ^{dully glossy} broad-fusiform, pointed ridges rugose, furrows smooth

parasitic on *Theobroma cacao*

tree, low and spreading,
leaves hanging vertically,
green on both sides, fls.
cream color with maroon
staminodes.

tall, erect tree, leaves hanging
vertically, almost white
beneath, fls. dark red
with maroon staminodes.
fruit oblong, green, with
the furrows strongly
rugose.

following contrast:

<i>T. cacao</i>	<i>T. bicolor</i>
erect	erect
ovate-cordate, white	ovate-cordate, white
beneath, strongly palmately veined.	beneath, strongly palmately veined.
open, appressed, in pedaxils.	open, appressed, in pedaxils.
dark red	dark red
2 mm. long with maroon terminal	2 mm. long with maroon terminal
appendage 1 mm. more long,	appendage 1 mm. more long,
this almost sessile.	this almost sessile.
2 mm. long	2 mm. long
5 mm. long, oblanceolate-acute,	5 mm. long, oblanceolate-acute,
somewhat spreading.	somewhat spreading.
2.5 mm. long, minutely white-papillate	2.5 mm. long, minutely white-papillate
papillate appearing velvety, oblong,	papillate appearing velvety, oblong,
blunt slightly retuse, ridges smooth,	blunt slightly retuse, ridges smooth,
furrows deeply longitudinally rugose.	furrows deeply longitudinally rugose.
sub-scandent, lvs. green,	sub-scandent, lvs. green,
fls. dull orange, fruit immature.	fls. dull orange, fruit immature.
"mata palo" serious pest.	"mata palo" serious pest.

Oct. 31 - 5 km. s. of Buga Sagrads,
El Valle 900 m.
flat valley floor, thickets
in low places.

1312 *Hamelia*

Oct. 31 - 5 km. n.e. of Filandia,
on highway from Pereira to
Armenia ~~El Valle~~ Caldas 1050 m.
second growth thickets on
steep slope

13 *Cinchona pubescens* Willd

14 *Guettarda*

15 *Lycopodium*

grassy roadside bank

16 *Polygala*

grassy roadside bank

~~16 *Polygala*~~

Oct. 31 - just n.e. of Circasia,
s. of Salento, on road
from Pereira to Armenia, ~~El Valle~~
Caldas 1900 m.

17 *Cinchona pubescens* Willd
shade tree in coffee plantation

18

parasitic on *Cinchona pubescens*

19 *Cinchona pubescens*

second growth thickets.

sub
bit range.

shoots

1. fls.
black,
c.

with

patches
for planta-
y common,
a good sized tree,
trunked
in fls.
angled

plant of *C. pubescens* shoots

at base of tree 3 m. tall

Oct. 31 - 5 km. s. of Buga la grande,
El Valle 900 m.
flat all the way

71312

Prostrata

11 P.B. 21 = 759

" 2 = 763

" 3 = 761

13

14

15

16

17

18

19

20

21

22

Rodriguezia 3004
(A. C. C. C.) 819

parasitic on *Condalia pubescens*
Condalia pubescens
second growth thickets.

little slender shrub
3 m. tall, fls. bright orange.

clump of sterile shoots
5 m. tall.

shrub 5 m. tall, fls.
white, ripe fruit black,
mostly not ripe.

fls. purple, root with
wintergreen odor.

hilly country with patches
of second growth and coffee planta-
tions. *C. pubescens* very common,
mostly shrubs, but some good sized trees.

Local Names
P.B. 21
C. 11
C. 11
C. 11
T.C. 11

Tree 12 m. tall, half strangled
by a ~~tree~~ *fig*, fls. pink,
fragrant. (Check sample)
plant green, fruit white.

shrub, tree 8 m. tall

Oct. 31 - 5 km. s. of Bugalagrande,
El Valle 900 m.
flat valley floor, thickets
in low places.

21312 *Hamelia*

✓ Oct. 31 - 5 km. n. e. of Filandia,
on highway from Pereira to
Armenia, El Valle Caldas 2050 m.
second growth thickets on
steep slope

13 *Cinchona pubescens* Vahl

14 *Guettarda*

15 *Lycopodium*

grassy roadside bank

16 *Polygala*

grassy roadside bank

~~*Guettarda*~~

✓ Oct. 31 - just n. e. of Circasia,
w. of Salento, on road
from Pereira to Armenia, El Valle
Caldas 1920 m.

17 *Cinchona pubescens* Vahl
shade tree in coffee plantation

18

parasitic on *Cinchona pubescens*

19 *Cinchona pubescens*

second growth thickets.

little slender shrub
3 m. tall, fls. bright orange.

clump of sterile shrubs
5 m. tall

shrub 5 m. tall, fls.
white, ripe fruit black,
— mostly not ripe.

fls. purple, root with
wintergreen odor.

hilly country with patches
of second growth and coffee planta-
tions, *C. pubescens* very common,
mostly shrubs, but some good sized trees.

Local Beliz
Aug. 2 1947
Ci 1.0
S. 1.0
TCA. 1.6

Tree 10 m. tall, half strangled
by a ~~tree~~ *Ficus*, fls. pink,
fragrant. (bark sample)
— plant green, fruit white.

slender tree 5 m. tall

Nov. La Aguadita

Cundinamarca

21320 *Angu...*
Wooded ravine in pasture
edge of second growth
woods

21 *Cinchona officinalis*
steep side of ravine

22 *Palicourea*
shade on side of ravine

23 *Psychotria*
shade on side of ravine

Nov. 5 - Canyon of quebrada ^{Cundinamarca} ~~Chalagana~~
below San Miguel, road
from Bogotá to Fusagasugá

Cundinamarca

24 *Cinchona officinalis* L.
avail of canyon, wet forest
steep slope

epiphytic on leaning tree trunks

25 *Cinchona officinalis* L.
steep slope, occasional

clump of slender shoots
about 6 m. tall, stems
brittle, fruits immature

herb up to 1 m. tall
fruits ^{pale} purplish, infl.
purple.

erect herb, 1 m. tall, fruit
white

Cinchona officinalis scattered
through the forest, mostly
small trees, being
harvested.

sterile tree 5 m. tall, 1 dm.
thick, leaves glossy, larger
than usual.

spreading herb up to
1 m. long, fls. bright
crimson

tree 6 m. tall, 7 cm thick,
fruits immature, all trees
seen in fruit have the
large spreading calyx
that this has.

Nov. 15 - Agua Buena, near La Igua, in road bet. Bogotá & Transpaso, Cordoba

- 27 *Ladenbergia undata*
grazed clearing

Nov. 16 - 5 km. s. of Pando, 4 km. s. of Acacoge, Tolima, s. of Rio Sumapay, Tolima

- 28 coffee plantation
29 *Coccoloba*
s. of Pando

Nov. 17 - Aurora, 12 km. s.s.e. of Cunday, upper Rio Vieja, Mun. de Cunday, Tolima 1500 m.

- 30 *Ladenbergia magnifolia*
wooded ravine, abundant

Nov. 18 - La Colonia Agrícola, 11 km. e. of Andaluia, w. slope of Cordillera de Altamira, Mun. de Cunday, Tolima 2000 m.

- 31 *Clusia utilis*
recently cleared pasture
formerly wet forest.

small bushy tree 4 m. tall, leaves green, petioles glaucous.

1000 m. abundant shrubs, fls.

1900 m. shrubs sapling to 1 m. tall, leaves glaucous

tree 25 cm. thick, 10 m. tall, others much taller.

tree 6 m. tall, old leaves red, fruits terminal on dead twigs. (other trees seen several times as tall 1 buds in thick green

1) Nov. 12 - Headquarters of Rio Grande, 200
 8 km. n.e. of La Colonia Agrícola.
 13 km. s. of Andahué, in slope
 of Cordillera de Alta...

L 32 *Cinchona pubescens* Vahl
 sparse second growth in
 pasture, wet forest

L 73 *Heteropogon gracilis*
 very abundant in boggy
 pasture in wet forest

L 34 *Cinchona officinalis*
 common in second-growth
 wet forest on more or less
 flat-topped ridge, leaf
 duff layer

L 35 *Calceolaria*
 forms row in pasture & forest
 in wet forest

L 36 *Centropogon*
 thickest in second-growth
 rain forest.

C. ... is common
 locally in the branches and
 sides of the Cordillera,
 but is rapidly being cleared out
 of its former habitat in the Andes.

2000 m. Tree 7 m. tall, really two
 sprouts out of an old
 stump, had been
 removed up to about 2 m.
 but had grown back
 to form a thin layer
 leaves purplish red
 beneath, especially the
 veins, old leaves red.

2000 m. "guina roya"
 tree, forming a mat,
 fruit red fleshy, fls.
 greenish

stump sprout 9 m. tall.
 5 cm. thick, old leaves red.
 veins were a less reddish.
 leaves more or less dull
 above. All the other seen
 were sprouts (only sample)

2000 m. small tree 6 m. tall, infl.
 yellow, fls. pale yellow.
 fruit blue-black.
~~shrub~~ shrub, fls.
 deep orange, column white,
 anthers blackish, fruit
 orange-brown.

Nov. 12 - on slope of Cordillera
~~between~~ ~~between~~ de la Cumbre,
 bet. headwaters of Rio Grande
 deo and Rio Grande Negro. 1000 m.
 low of Cordillera, shrubs
 under stones. 1100 m.
 second growth, light, ~~in~~ ~~at~~
 Palicourea

L 333

L 33 Palicourea

L 39 Cestrum

L 40

Nov. 12 - ridge over to Rio
 Grande Negro and Rio Grande
 deo, 2 km. e of Cordillera,
 Grande today, Tolima 2000 m.
 flat topped ridge of second
 growth.

L 41

slender shrub 5 m. tall,
 infl. reddish-black-purple.
 lvs. greenish, firm
 basal coriaceous, punctate
 - infl. drooping.
 shrub 2 m. tall, infl.
 coral red, fls. bright purple.
 shrub 1 m. tall, infl.
 bright purple. fruit
 fleshy, pale dull greenish
 erect herb, fls. ~~scarlet~~
~~red~~ scarlet, anthers ^{dusty} brown

erect herb 1.5 m.
 long, corolla scarlet, with
 lobes yellow, column
 yellow, anthers with
 connective red, sac
 brownish

Apr. 12

Quiring in region bet. the
 Guadalupe and drainage of
 Rio Cunday — down a road
 600 ft. *C. tuberosus* —
 occurs where any saved
 growth is left. though
 most of this is cultivated
 as in pasture. Apparently
 formerly there was a
 belt bet. 700 ft. and
 900 ft. or more where
C. tuberosus ~~was~~ occurred
 locally, mostly in
 "manchas". This area is
 larger than could be
 expected because of
 the permanent plateaus
 and benches in the topog-
 raphy. Now most of
 this has been harvested
 excepting in the most
 inaccessible places and
 the quiring are going
 back after the sprouts
 that they left the first time.
 The form found here is
 the same as that found
 as far northeast as La Cruz
 B. Lita and Agua Bruta.
 above Fuzguasaga

It is more suggested
 by cultivation —
 In talking with the
 quiring in the western
 Guadalupe region, they
 were mentioned as having
 as yet not reached the
 southern Cordillera de
 Pilarnal, from La Colonia
 south toward Dolores —
 and to be inaccessible
 by lack of trails. The
 headwaters of the Rio
 Guadalupe were mentioned
 and the region of Santa
 Ana, Quila, east of
 the Cordillera Gigante.
 The headwaters of the
 Rio Ruda are being
 much talked of. A
 piece of *C. tuberosus*
 was brought down me
 from there in August by
 the Inspector of Police, ex-
 Major, in La Concepcion.
 One of Robertson's men
 has been about 2 days
 down from the headwaters
 of the Ruda and brought
 back *C. tuberosus* with
 reports of enormous
 quantities.

Nov. 21 - Hills west of Laguna
Guataqui

sub-paraño bush undergrowth
gentle slope 2900-3000 m.

L 442

Cratogeomys

thicket common

L 443

Stemodia

occasional along trail

L 444

Stemodia

occasional in thicket

L 445

rare along trail

L 446

Salvia

common in patches

L 447

Cestrum

occasional

L 448

~~Cephaelis~~ Cephaelis

occasional

L 449

Gentiana

in open places

Weak shrub 1.5 m tall.
upper bracts and calyxes
red in distal two thirds,
corolla green above, yellow
beneath.

~~erect~~ sticky, suffrutescent
herb, 1 m. tall, fls. whitish
turning pink.

very sticky, suffrutescent
herb, 1 m. tall, fls. reddish
with conspicuous white
style.

decumbent herb, 1 m. long,
ascending distally, fls.
white.

rank growing bushy
herb, 1 m. tall, leaves very
rugose, calyxes blue-black,
corolla blue.

shrub 1.5 m. tall, fls.
greenish white, lobes
dark.

shrub 1.5 m. tall, fls.
rose-pink, not sticky,
leaves white beneath.

fls. pale purple with
dark markings especially
toward base.

- 21300 *apricus*
openings occasional
- L 51 *Eupellatis*
common in openings and
rocky place
- L 52 *Hedyotis*
common in open place
- L 53 *Pachyanthus*
common in open place
- L 54
in thickets in top of hill
- L 55 *Miconia ligustrifolia*
common
- L 56 *Passiflora*
common in open place

✓ Nov. 21 - shores of Laguna Guatavita

2900m.

- grassy, weedy slopes occasional
patches of brush, grazed
- L 57 *Daucus*
under small tree, steep slope
- L 58 *Cardamine*
under small tree
- L 59 *Weinmannia*
brush patch, rocky place
- L 60 *Elaphoglossum*
rock ledges

low, leafy stems
~~the~~ selenyodor when
broken,
almost acaulescent
rosette inflorescences
strictly erect, fls. yellow
erect shrub up to 0.3 m. tall,
leaves pale beneath,
rosettes bluish-green,
fls. white,
shrub up to 0.3 m. tall
fls. greenish yellow,
shrub 0.5 m. tall, compact,
fruits but leaves green
white
erect, leafy stems

fls. white

shrub 2.5 m. tall, fls.
whitish, fragrant but
not pleasantly so

- 71361 Baccharis
 occasional along ravine
 62 Juncus bufonius
 grassy place
 63 Mutisia
 climbing in brush
 64 Eulciliun
 common
 65 Alchemilla
 common among grass
 66 Carex
 common in edge of water
 67 Alchemilla
 common among grass
 68 Galium
 rare among grass
 69 Drymaria
 one plant in large crevice
 under rock

Nov. 22 - Choachi

Cundinamarca ca

wet dry cultivated field

1250 m

- 70
 71
 72 Boneria
 73 Centaureium
 74 Ambrosia
 most abundant plant in field
 75

shrub 1 m. tall

heads pendent, rays
 - scarlet.
 erect herb up to 1.5 m. tall
 upper stems + involucres
 maroon purple, rays deep
 brilliant purple, disk
 dull reddish yellow
 decumbent to erect

small clumps.

decumbent to erect

prostrate from thick root

- fls. white
 - oily odor when broken

- fls. pinkish
 perennial

small spreading tree
 fls. white.

51370 Polygonum

Nov. 23 - 3 km. e. of Choachi
along Quebrada Salitre,
Mesa de Choachi. Cordillera Occidental
second growth woods. 7200-2050 m.

L. 77 Siphocampylus
second growth brush

L. 78 Durante

L. 79 Tulicouea
rather open forest

fls. white

Considerably denuded up to
about 2400 m., some secondary
second growth below that.
C. guianensis has been
abundant here, but it
has been harvested. At about
2050 m. *C. officinalis* of a
peculiar type starts.
It is localized in manchar.
Vargas and Ballester say
that harvesting of *C. officinalis*
has scarcely begun
here, and that there should
be production for a year.
The forests extend, at these
altitudes, north to Mundo
Nuevo.

2300 m.

scrambling branched
shrub, corolla bright
crimson red, column white,
anthers blackish.

2200 m.

erect shrub 3 m. tall,
leaves glossy, somewhat
rugose above dull & paler
beneath, fls. white.

2050 m.

shrub 2 m. tall, branches
weak, fls. and inflorescence
purple.

- 1340 *Cinchona oficinales* L.
 17 rather open forest on steep southern
 slope, several trees 20-30 m.
 2 g. v. "naveha".

For sample taken, section-
 banded & roughed into
 2 equal samples, for a
 drying experiment. One
 part is to be dried in sun,
 one in shade, and one rotted.

- 19 81 *Cinchona pubescens*
 lower edge of forest, rather
 mature second growth,
 quite common but mostly
 harvested already.

- 82 *Galium*
 lower edge of forest

Anal. Bellis

Dried in shade	
q+c	2.5
(q+s)	1.7
cin	1.5
quin	mm 5
TCH	4.0

Dried in sun

q+c	2.7
(q+s)	1.9
cin	1.3
quin	traces
TCH	4.0

Rotted

q+c	3.1
(q+s)	1.0
cin	1.1
quin	mm 1
TCH	3.2

2400 m.

Anal. Bellis

Sample dried in sun	
q+c	0.61
cin	1.23
quin	traces
TCH	1.84

Sample dried in

shade	
q+c	0.46
cin	1.39
quin	traces
TCH	1.85

Sample rotted

q+c	0.61
cin	1.23
quin	traces
TCH	1.84

tree 20 cm thick, 15 m. tall,
 leaves glossy above, with
 reddish veins, margins
 tending to be revolute,
 stipules reddish & green,
 erect, rather caespitose angled,
 fls. deep purple with
 white hair, tending to
 be ascending in the clusters,
 fruits thick, slightly
 compressed. (This plant
 in many ways approaches
C. pitayensis, especially
 in the shape of the fruit,
 though the latter is not
 strongly ribbed. The
 small stipules are not
 like those of *C. pitayensis*,
 not officinalis, but more
 resemble those of some forms
 of *C. pubescens*). "Guinana"

tree 15 cm. thick, 12 m. tall,
 veins of leaves reddish,
 stipules green, erect,
 becoming strongly revolute,
 green roya.
 bark sample cross-sectioned
 into 2 equal parts, one to be
 dried in sun, the other in shade,
 roots yellowish. plant
 low spreading but not
 prostrate.

Nov. 24 East of Cerro de
Forte, district of Llanadara
10 km. no. of Choachi, Prov.
de Bolívar, Llanadara in
moist woods. 2600 m.

21324 *Ladenbergia unguiculata*
common on s. slope

21325

rare in shade, temperature?

85 *Cinchona officinalis* L.
scattered in woods on
s. slope.

86 *Myrsine coccinea*
common in ridge top of primary
forest.

87 *Cinchona officinalis* L.
scattered in woods on s. slope.

Nov. 25 - Choachi

Llanadara
2200 m.

88 *Ficus*
in yard, abundant on s. slope

tree 20 cm. thick, 14 m. tall,
others much larger.
- seen. "agucena"
erect, fls. yellow.

slender tree, 10 cm. thick
13 m. tall, 2 terils.

shrub 2 m. tall, fls.
rose-pink with 2 white
stripes on each of 5 lobes.
tree 1 cm. thick, 8 m. tall.
Bark being harvested.

tree with weeping habit.

Dec. 5 - n. slope of Páramo Páramo,
8 km. e. of El Colegio, 3000 m.
with *Begonia* *Andeanana* ca
2000-2500 m.
wet forest with many epiphytes

V1389 *Ceanothus peruviana* Vahl
along stream common locality.

- L 3 90 *Hydrocotyle*
rocks along stream
L 3 91 *Psychotria*
undergrowth on steep slopes
L 3 92 *Conchocarpus*
steep slopes common.

slopes above 1400 m. well
wooded. a considerable stand
of *Begonia* *Andeanana* at about
2000 m. on the bottom of
gullies. the trees are
more or less deciduous
but this is a species
is considerable to *Andeanana*
the usual large tree
from this region.
at 2000 m. in diam.
many smaller, but
no seedlings. collected
herb sample of each
with herb. all ~~the~~
several without, these
under *Andeanana* etc.

And. Bellis
H+L - 2.5
L - 2.4
G - 2.5
T.C.A. - 2.4

tree 40 cm in diam 10 m.
tall. top dead, dead spots
in bark of trunk, loaded
with epiphytes. (herb
leaves red, (bark in sample)
(bark in sample is bark in sample
from similar tree nearby)
prostrate

herb, 1 m tall, pink
purple. (root to distal part
tree 10 m. thick, 10 m. tall
leaves green, very few red ones.
(herb sample) (other is from other
tree under *Andeanana* etc.
V131, V132)

And. Bellis
H+L - 1.9
L - 1.5
G - 0.1
T.C.A. - 3.5

s.n. *Macrocnemum*Near Rio Negro, Trail from Bolivar to
San Sebastian, Cauca.s.n. *Cinchona officinalis*Reg. of Alto Caguela, sent in
by correspondent from the Andes.
(~~not~~ exact origin not certain
anal. bellis)s.n. *Eleagia*?above El Carmelo, near Santarosa,
Cauca7 *Cassia*near Los Milagros, road from
Bolivar to Los Milagros, Cauca
"galvis" tree 3 m. tall, 20 cm. thick.

8

Los Milagros, Cauca, Cord. Cent.

9

Los Milagros, Cauca, Cord. Cent.

- 1 white fl., Cord. Cent. Cauca

s.n.

s.n. *Liparuna*

251

fl. yellow-orange

252

vine

254

*Bomarea*in forest of P. Jose Menadjed
tuber called "sachapapa"255 *Bomarea*

"sachapapa"

261

La Cuchilla de El Letrero

270 *Ladenbergia*

fl. white

with
P. HuntadRegion of Cerro de San Pedro,
Cord. Occ., w. of Rio Patia, Cauca.

271

Rondeletia

at Casade Abel Solante,

Diviso Chicaos

shrub with fl. rose-colored

- 273 *Passiflora*
El Boquerón, above Rio Guayas,
n. of San Pedro
- 274
El Boquerón
- 276 *Cinchona pitayensis*
El Boquerón
- 278
Los Pesitos, near central de
Los Cerillos, head of Rio Guaita
shrub 3-4 m. tall. fl. yellow,
inf. 1 m. long.
- 279 *Cinchona pitayensis*
n. side Cerro San Pedro, ~~but~~
trail from Boquerón to Argelia
- 283
- 288 *Condaminea corymbosa*
- 291 *Psychotria*
El Boquerón
- 292 *Rondeletia*
trail to San Alfonso from La Mesa
"haujón de los Andes"
- 293 *Cinchona*
Buenos Aires, garganta de la
Cordillera sobre San Alfonso

- San Alfonso, Cord. Occ.
w. of Rio Patia
- 294 *Clematis*
"bejuco alcali"
- 295 *Condaminea corymbosa*
Rio Capitanes, trail
from Patia to San Alfonso

- 1944
- near Rio El Santa Rosa,
upper Rio Caquetá, Cauca
- 500 *Cinchona officinalis*
above house of Canon J. Rivas,
Cordillera La Soledad
tree 10 m. tall, 30 cm thick
"quina roja"
- 501 *Cinchona officinalis*
El Carmelo
- 502
above property of Juan J. Mendez,
to Rivaldo Cuchilla de
Quebradillas, El Carmelo
tree 5 m. tall, 5 cm thick
- 503 *Cinchona officinalis*
same "quina terna"
- 504 *Cinchona officinalis*
same "quina terna"
- 505 *Cinchona officinalis*
same "quina terna"

192 1944 Colombia J. G. Granger

- 506 *Cinchona officinalis*
above casa de Felisa Cruz,
Las Mesitas
"guineo rojo" tree 7 m. tall,
15 cm. thick.

1943 Colombia 193

J. G. Granger & C. Rodriguez

- VV Finca Las Mesitas
from near Silvia, 3000 m.
2 Cord. Central, Cauca.
1 *Calceolaria*
"boca dragon"
2 *Podocarpus*
"chaguero" or "pino"
3
4 *Euphorbia peplus* L.
5 *Oxalis*
"chilco"
6 *Galium*
"raicilla"
7
8 *Momonga*
9 *Burmeistera*
10
11
12
13
14 ~~*Euphorbia peplus*~~ no. omitted
15 *Castilleja*

not over
1 guineo
by J. G. G.

194

1947

Columbus

Gauguin & Rodriguez

16

17 Fuchsia

18 Asplenium

19 Rubus

20

195

1943 - Colombia

Collections made for me by others

~~Brodbeck #1~~*Cinchona pitayensis*

S.W. slopes of Nevado del
Huila above Tacueyo, bet.
Rio Santo Domingo & Quebrada
San Luis, ~~drainage~~ affluents
of Rio Palu, Cauca 2500-2800 m.

Brodbeck #1, #2, #3.

Cinchona pitayensis

E. base of Volcan Doña
Juana, drainage of Rio
Tapumbina S.E. of La Cruz
(specimens brought in with
bark by a quintero)

Oct. 19 1943

Cinchona pitayensis

~~base~~ above San Gerardo,
Rio Mayo drainage, n.e. of
La Cruz Nariño

(specimens brought in by
quintero) Oct. 17 1943

Cinchona pitayensis

Slopes of Volcan Doña Juana,
S.E. of La Cruz Nariño

(specimens brought in by
quintero) Oct. 15, 1943



